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A
SYSTEM
OF
SURGERY.

BY

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A TREATISE ON THE THEORY AND PRACTICE OF SURGERY.

CHAPTER XXXVI.

Of Wounds.

SECTION I.

Of Wounds in general.

VARIOUS definitions have been given of the term Wound; but few if any of them appear to be exact. Boerhaave defines a wound to be, a recent bloody ſolution of continuity in any ſoft part, by the motion, preſſure, or reſiſtance

ance of ſome hard or ſharp body. By Sauvages, it is ſaid to be a mechanical diviſion of any fleſhy part, attended with a ſeparation of the parts newly divided, together with a diſcharge of blood and a tendency to inflame and ſuppurate. And Ludwig defines a wound to be a morbid diviſion of parts which in a ſtate of health ought to be united.

Theſe are the definitions of this term which have been moſt generally adopted; but it is evident that none of them are ſufficiently correct. A part may be deeply cut, even large blood-veſſels may be divided, without any diſcharge of blood taking place, as frequently happens in lacerated wounds, and in ſuch as are attended with much contuſion: and where the ſmaller veſſels only are divided, the diſcharge of blood ceaſes, almoſt in every inſtance, in the courſe of a fewhours from the time that the wound was inflicted.

The definition recited above from Mr Sauvages is too extenſive: It comprehends a period or ſtage of wound which does not always exiſt, viz. a tendency to ſuppurate. We know that wounds frequently terminate in gangrene and death, without any previous ſuppuration; while in other inſtances they heal by the firſt intention, and their edges adhere to one another without any appearance of pus.

Neither is Dr Ludwig's definition of a wound correct: Parts which ought to be united, may be divided without being wounded. Thus a blood-veſſel, nerve, tendon, or muſcle, may be completely ruptured either by a violent ſprain or a contuſion; but unleſs the correſponding ſkin and other teguments are divided, we do not ſay that ſuch parts are wounded. Nor are theſe affections confined to the ſmaller muſcles and tendons; for inſtances often occur of the different parts even of the largeſt muſcles being thus violently ſeparated from one another.

Every recent ſolution of continuity in the ſofter parts of the body, when attended with a correſponding diviſion of the teguments, may be denominated a wound.

From this definition of wounds, it is evident that they will exhibit great variety in their nature and appearances. This will ariſe from different cauſes; but more particularly from the nature of the injured parts; from the manner in which they have been produced; and from their extent.

Thus wounds in fleſhy muſcular parts are very different, both in their nature and appearances, from ſuch as affect membranous or tendinous parts only. Wounds that are made with a ſharp cutting inſtrument are materially different from ſuch as are attended with much contuſion or laceration: and punctured wounds exhibit very different appearances, and for the moſt part are productive of very different effects, from ſuch as are more free and extenſive. In the ſubſequent parts of this ſection theſe varieties in wounds will be conſidered. In the mean time, we ſhall give a deſcription of the phenomena which uſually take place in the moſt frequent form of this affection, what may be termed a Simple Inciſed Wound; by which both the theory and practice which we mean to inculcate will be rendered more intelligible.

On the inſtrument being withdrawn with which a wound of this kind has been made, the firſt appearance we take notice of is a ſeparation to a certain extent of the divided parts; and this always in a greater or leſſer degree, according to the depth and length of the wound, and according as the fibres of the injured part are divided more or leſs tranſverſely. Thus a wound, even of a conſiderable length, if it runs in the ſame direction with the fibres of a muſcle, will be attended with a ſmall retraction of the ſkin; while a large vacuity will take place in a wound of leſs extent where a ſtrong muſcular part is cut directly acroſs. Nay, in this laſt caſe, the ſeparation of the divided parts is in ſome caſes ſo conſiderable, as to give cauſe to ſuſpect that a portion of them has been removed; while in the other it is often ſo trifling, that even an extenſive wound will have the appearance of a ſtraight line only: a circumſtance by which practitioners have been often led to conſider as of no great importance, wounds which in their conſequences have proved to be formidable; and by which the propriety of examining every wound with attention is ſtrongly pointed out.

The next appearance which takes place in wounds, is a diſcharge of blood to a greater or leſſer extent, according to the ſize of the cut and to the number and ſize of the veſſels that are divided; at leaſt this is the caſe in wounds made with a ſharp cutting edge. Where the parts have been much bruiſed or lacerated, we have already remarked, that even large blood-veſſels may be divided without any hemorrhagy enſuing.

For the moſt part, this evacuation of blood from wounds proves ſo alarming, that means are employed to ſtop it; but when this is either neglected or not conſidered as neceſſary, if the injured veſſels are not large, the irritation produced by the wound itſelf, as well as by the free application of the external air to their divided extremities, excites ſuch a degree of contraction in them, that in this way alone the hemorrhagy is ſoon checked: The diſcharge of red blood becomes gradually leſs: It then ceaſes entirely, and is ſucceeded by an oozing of a ſerous fluid, which in the courſe of a few hours likewiſe ſtops, when the whole ſurface of the ſore is found either ſomewhat dry or even parched-like; or it is covered over with a cake of coagulated blood.

In this way nature ſeems to operate in putting a ſtop to hemorrhagies which ariſe from wounds. Another idea is commonly entertained indeed of this ſalutary proceſs: It is ſuppoſed that ſmall coagula of blood plug up the orifices of the veſſels, and remaining in them preſerve them of the ſame ſize of which they were before being divided.

This, however, is by no means the caſe,

as will at once appear to any who will take the trouble of diſſecting the ſtump of a patient dying after an amputation. Inſtead of the mouths of the divided arteries being plugged up with blood, he will find them perfectly empty and contracted for a conſiderable ſpace from their extremities; nay, in moſt inſtances, he will obſerve that they become firm ſolid cords, ſo as never afterwards to be capable of receiving a ſupply of blood. Nor is this proceſs of nature difficult to explain. It is arterial hemorrhagies we are now conſidering; for wounded veins, if they be not compreſſed between the injured part and the heart, ſeldom diſcharge ſo much blood as to prove alarming. Now, as the arteries are poſſeſſed of a ſtrong contractile power, they will readily exert this power on the irritating cauſes mentioned above as attendants on wounds, being applied to them. In this manner the blood is prevented from flowing in its uſual channel; but nature does not fail to provide a different route for it, by forcing it through the moſt contiguous anaſtomoſing arteries, which ſoon become ſo much enlarged, as to allow it to paſs with freedom; while, in the mean time, the contracted ſtate of the wounded extremities of the arteries terminates in a firm adheſion of their ſides, in conſequence of that inflammation which in ſome degree ſucceeds to every wound.

When a wound is made with a clean cutting inſtrument, the pain attending it at firſt is in general inconſiderable, unleſs a nerve or a tendon has been partially divided; in which caſe it proves commonly ſevere. But in every caſe the wounded parts become painful in the courſe of a few hours from the time of the injury being inflicted. They become red, tenſe, and even conſiderably ſwelled: And where the wound is extenſive, an increaſed degree of heat takes place, together with thirſt, quickneſs of pulſe, and other ſymptoms of fever.

In ſome inſtances theſe ſymptoms continue to increaſe, and to prove more and more ſevere, till at laſt they terminate in mortification; but for the moſt part they are carried off in a more favourable manner. The ſurface of the wound, which for ſome time remained perfectly dry, is gradually rendered moiſt and ſoft by a thin ſerum oozing into it; which being allowed to collect, is at laſt, by the heat of the affected parts, and in ſome caſes by the application of artificial heat, converted into purulent matter: and in general, the preceding ſymptoms of pain, tenſion, and fever, abate more or leſs quickly according as this formation of matter is more or leſs plentiful. From the time that ſerum begins firſt to ooze into the cavity of a wound, the tenſion and pain begin to abate, and they vaniſh entirely on a free ſuppuration taking place; by which the moſt natural balſam is produced that can be applied to wounds.

From this hiſtory of the progreſs of a wound, it is evident that all the ſymptoms we have enumerated, are ſuch as originate from inflammation. Indeed, they are exactly ſuch as accompany a common phlegmon. The pain, redneſs, and tenſion, which always accompany wounds to a certain degree, are the leading ſymptoms in every caſe of phlegmon; and the ſerous effuſion into the cavities of wounds, with the ſuppuration which enſues, are circumſtances exactly ſimilar to thoſe which occur in every caſe of abſceſs. I therefore conſider a wound as an exciting cauſe of inflammation; and ſome advantage, I think, may be derived in practice, from conſidering it chiefly in this point of view. This, however, will more clearly appear when we come to ſpeak of the method of cure; when it will be rendered obvious, that in the treatment of wounds, thoſe means prove uniformly moſt effectual which are moſt powerful in preventing any violent degree of inflammation.

The deſcription I have given of wounds

relates to the moſt ſimple and leaſt hazardous kinds of them; where the injury has been done, as was already remarked, with a ſharp cutting inſtrument, and where the parts have been laid freely open. In ſuch circumſtances, when no organ of much importance to life has been divided, and when the cut is ſeated in a fleſhy muſcular part, if nature be not impeded in her operation, the whole ſurface of the ſore becomes covered with ſmall ſprouts or granulations almoſt immediately on a free ſuppuration taking place; and theſe continuing to advance, a cure is at laſt accompliſhed in the manner already deſcribed in a former part of this work †.

This happy termination of a wound, however, may be prevented by various cauſes. Indeed, it requires the concurrence of many circumſtances. Theſe we ſhall afterwards have occaſion to treat of in a particular manner. At preſent I ſhall enumerate thoſe only which ariſe from the nature of the wound.

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† Vide Treatiſe on the Theory and Management of Ulcers, &c. Part II. Section II. § 2.

In a free inciſed wound, the inflammation which takes place is not in general greater than is neceſſary to produce that degree of ſuppuration which we have ſhown to be requiſite; and in wounds of this deſcription, matter is never allowed to lodge, as it is commonly diſcharged almoſt as ſoon as it is formed. Theſe are points of the utmoſt moment in the management of wounds. Indeed, it is known to every practitioner, that a cure can never be expected if a due degree of inflammation does not take place, and if a free outlet be not given to the matter that may form. Every circumſtance therefore in the nature of a wound, which tends either to excite an undue degree of inflammation, or to produce a lodgement of matter, muſt be conſidered as unfavourable: And hence punctured wounds, and thoſe that are attended with contuſion or laceration, are particularly hazardous.

Punctured wounds prove often more dangerous than wounds of greater outward extent, from large blood-veſſels and other deep-ſeated parts being hurt: and they are commonly more painful, being frequently attended with a partial diviſion of contiguous nerves or tendons; a circumſtance productive of more violent pain than what uſually enſues from a free diviſion of them. But the greateſt riſk in a punctured wound ariſes from the lodgement of matter; a circumſtance which takes place more readily in this than in any other variety of wound; and to obviate which, the niceſt attention on the part of practitioners is often requiſite.

In contuſed and lacerated wounds, if the violence with which they have been inflicted has not been conſiderable, the parts will frequently recover their tone; the attending inflammation will not run to any great length; and a free ſuppuration being induced, a cure will at laſt be accompliſhed in a manner ſimilar to what we have deſcribed in caſes of ſimple inciſed wounds. But it often happens that the contiguous parts are ſo much injured as to give no cauſe to expect ſuch a favourable event. Where a violent degree of contuſion has been applied, the texture of the parts affected is ſometimes ſo completely deſtroyed, that the circulation is ſtopped, and mortification enſues; and where this proceeds to any conſiderable extent, the danger attending it is always great. Again, in wounds attended with much laceration, mortification is apt to occur from a different cauſe. The pain and irritation attending them proceed ſometimes to ſuch a height, as to induce a great degree of inflammation; which, notwithſtanding the means uſually employed to prevent it, very frequently terminates in the manner we have mentioned. Indeed, ſo far as my obſervation goes, inflammation induced by this cauſe is more apt to terminate in gangrene than any other inflammatory affection proceeding from external violence.

In forming a prognoſis of wounds, the circumſtances we have juſt been conſidering merit our particular attention: but there are others which ſhould likewiſe be kept in view; and theſe more eſpecially are, the age and habit of body of the patient; the texture of the wounded part; the part of the body in which the injury is inflicted; and the riſk of ſuch parts of importance as lie contiguous being ultimately made to ſuffer, although not immediately injured.

Thus, it is obvious, that in a ſound healthy conſtitution, wounds will, cæteris paribus, be leſs hazardous than thoſe that are inflicted on people of diſeaſed habits of body; for we commonly obſerve, where the conſtitution is tainted with any diſeaſe, that even the ſlighteſt wounds are apt to become troubleſome, and to degenerate into ſores which will not heal till the diſeaſe of the ſyſtem be removed: And we alſo obſerve, that the healing of ſores depends in ſome meaſure upon the age of the patient; that is, a cure is for the moſt part more quickly accompliſhed in youth and in middle age, than in very advanced periods of life.

There are many exceptions, however, to this; for whenever the natural firmneſs and elaſticity of the muſcular fibres are not much impaired, we do not find that old age proves unfavourable to wounds. When the conſtitution is poſſeſſed of ſuch a degree of firmneſs and irritability, that any wound which takes place will be productive of a neceſſary degree of inflammation, old age ought by no means to be conſidered as a diſadvantage. On the contrary, in ſuch circumſtances it proves always ſalutary, by tending to render the ſymptoms more moderate than they are apt to be in more early periods of life. This is particularly the caſe in extenſive wounds of every kind:

and we obſerve it in a remarkable manner in chirurgical operations; eſpecially in lithotomy, and in the amputation of any of the extremities; which have commonly, in the courſe of my experience, proved more ſucceſsful in healthy old people than at any other period of life, and evidently from the cauſe we have endeavoured to point out.

With reſpect to the texture of a wounded part, it is well known that wounds heal not only more quickly but more kindly in ſome parts than in others. Thus wounds of the cellular ſubſtance heal more eaſily than ſuch as paſs through any of the muſcles; while thoſe that are confined to the fleſhy parts of muſcles prove much leſs formidable than wounds of tendinous or ligamentous parts; for, beſides occaſioning leſs pain and inflammation, they are not ſo apt to be productive of any permanent diſadvantage. The deepeſt cuts may be inflicted on the belly of a large muſcle, with little or no riſk of any inconveniency being experienced from them in future; but the contiguous joints are very apt to remain ſtiff and unmanageable, when the tendons which paſs over them are much injured.

When wounds penetrate to a ſtill greater depth, ſo as to do any material injury to bones, they prove always more tedious and uncertain than when ſoft parts only are divided: for in ſuch caſes a wound will ſeldom or never heal till ſome portion of the bone exfoliates; a proceſs which very commonly requires a conſiderable length of time to be accompliſhed *.

Wounds in glandular parts are more to be dreaded than the mildneſs of the ſymptoms which appear at firſt would lead us to imagine. When ſmall glands only are divided, they often heal readily; but when any of the larger glands are injured, the ſyſtem is not only apt to ſuffer from the ſecretion for which they are intended being impeded, but the

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* Vide Treatiſe on Ulcers, &c. Part II. Section VII.

ſores which enſue very commonly become fungous, and are cicatriſed with difficulty.

When any of the larger lymphatic veſſels are wounded, the cure often proves tedious by a conſtant diſcharge of a thin limpid fluid, by which the formation of a cicatrix is prevented: And when at laſt a cure is obtained, very troubleſome ſwellings are apt to occur in the under part of the limb, owing to the obſtruction of the lymph in its paſſage to the heart by the newly formed cicatrix. Of this every practitioner of experience muſt have ſeen ſome inſtances. I have met with ſeveral; particularly after the extirpation of ſcirrhous glands when deeply ſeated in the arm-pit. In ſuch caſes the large lymphatics of the arm are very frequently cut, and very obſtinate œdematous ſwellings of the whole member are apt to enſue.

When a large nerve is completely divided, the pain attending it will be inconſiderable; but the parts beneath will be deprived both of their ſenſibility and power of motion, unleſs they are ſupplied with ſome other branches. But when a nerve is only punctured, the pain which takes place is commonly ſevere: and this is apt to be followed with a high degree of inflammation; ſmart fever; ſubſultus tendinum; convulſions; and even death. Theſe violent appearances, however, do not often occur in northern climates; but they frequently happen in warm countries, where they are apt to terminate in a ſymptom which often proves fatal, the locked jaw.

In wounds of any of the larger blood-veſſels, our firſt object is to diſcover, whether the hemorrhagy which enſues proceeds from arteries or veins; for in general no material inconvenience is experienced from wounds even of the largeſt veins, while the utmoſt danger is to be dreaded from wounds of the larger arteries. If the artery be ſo ſituated that a ligature cannot be put round it, the loſs of blood will probably ſoon prove fatal: and even where the diſcharge of blood can be ſtopped with eaſe; if the limb has no other artery to ſupply it, a mortification is to be dreaded. It often happens, indeed, even that large arteries are ſecured by ligatures without any detriment to the parts beneath : But in this caſe there are other arteries or anaſtomoſing branches of ſuch a ſize as to give paſſage to a ſufficient quantity of blood.

The ſite of a wound is alſo an object of importance. Thus wounds in the extremities, when confined to parts lying above any of the hard bones, are not to be conſidered as ſo hazardous as thoſe which paſs into any of the joints : and in other parts of the body, wounds which penetrate any of the larger cavities, prove always more dangerous than thoſe which do not run to ſuch a depth.

This will proceed from different cauſes. The danger will be increaſed by the chance of ſome organ of importance being directly injured : By air, and in ſome caſes by extraneous bodies finding acceſs to cavities which nature never meant to be expoſed: And laſtly, by the lodgement of matter; a circumſtance which is with much difficulty avoided in all wounds which penetrate to ſuch a depth.

We have likewiſe to conſider, that although no organ of importance may be directly wounded in ſuch a manner as to produce immediate death; yet that much danger may ariſe from a variety of circumſtances; and wounds may eventually prove mortal which at firſt were not attended with any evident riſk.

Thus wounds in the lungs, and other viſcera, prove ſometimes fatal, from continuing to diſcharge ſuch quantities of blood for a conſiderable time as at laſt deſtroy the patient; although at firſt the diſcharge might not appear to be of much importance. The ſtomach, and different parts of the alimentary canal, may be injured in ſuch a manner as to terminate in death without exhibiting any immediate appearance of danger. The external coat of the aorta has been removed by the point of a ſmall ſword; and the wound has been nearly healed when the patient died ſuddenly from a rupture of the artery: And wounds of the gall-bladder, or of its excretory duct; of the receptaculum chyli; of the thoracic duct, and ſome other viſcera; may for ſeveral days afford no ſuſpicion of danger, and yet terminate fatally at laſt.

Wounds ſometimes prove fatal from inflammation ſpreading to contiguous viſcera which were not at firſt injured; and wounds, which have at firſt appeared to be of little or no importance, have at laſt terminated in the worſt manner, merely by miſmanagement; either in the application of dreſſings or bandages; or in the conduct of the patient with reſpect to food, drink, and exerciſe: for it is well known, that much miſchief has been done by improper dreſſings, and eſpecially by too light bandages: and we likewiſe know, that miſconduct with reſpect to food is daily the cauſe of wounds going wrong, which otherwiſe would probably have done well.

It thus appears, that a variety of circumſtances fall to be conſidered, to enable us to judge of the probable termination of wounds. In doing this with accuracy, practitioners of experience have frequent opportunities of ſhowing their ſuperiority. This ſubject ought therefore to be conſidered as highly important by all who wiſh to diſtinguiſh themſelves. A minute knowledge of anatomy, a cool temper, and a ſteady hand, will enable any practitioner, even with no great experience, to perform many of our moſt important operations ſufficiently well: And accordingly, in different hoſpitals, we daily meet with good operators; but we do not often find ſurgeons poſſeſſed of that knowledge in the prognoſis of chirurgical diſeaſes which might be expected; that attention being ſeldom beſtowed which is neceſſary to attain it.

SECTION II.

Of the Cure of Simple Inciſed Wounds.

IN the management of wounds of every kind, the firſt object requiring our attention is the hemorrhagy; more eſpecially when it is profuſe. The ſafety of the patient requires it: The alarm which it gives, not only to byſtanders, but to the practitioner himſelf, renders it neceſſary. Nor can the real ſtate of a wound be diſcovered with accuracy till the diſcharge of blood be checked.

Hemorrhagies are moſt immediately ſtopped by preſſure applied to that part of the divided artery which is next to the heart: This preſſure is made by the tourniquet, when the wound is in any of the extremities*; and by the hands of aſſiſtants, in wounds of the trunk of the body or of the head.

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* Vide Vol. I. Chap. II.

In this manner, if the preſſure be properly applied, almoſt any hemorrhagy may be ſtopped till the wounded veſſels can be ſecured with ligatures; which we have elſewhere ſhown to be the ſafeſt as it is the eaſieſt method of preventing patients with ſuch injuries from ſuffering*. Much indeed has been ſaid, even of late years, of the inconveniences which ligatures are ſuppoſed to induce: but this has proceeded either from the intereſted views of ſome individuals who may have wiſhed to eſtabliſh the reputation of different ſtyptic applications; or from the groundleſs fears of young practitioners. Where the contiguous nerves, or even where much of the ſurrounding muſcular parts, are included in ligatures, ſevere pain, and other troubleſome ſymptoms, will no doubt be induced; but this is not the fault of the remedy, but of the method of uſing it. Indeed this is ſo obviouſly the caſe, that reaſoning in the farther ſupport of it does not ſeem to be neceſſary; for every practitioner of experience will admit, that a proper application of the ligature is ſeldom if ever productive of any material inconvenience, and that we can depend on it with more certainty than on any other remedy for putting a ſtop to hemorrhagies from wounded arteries.

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* Vide Vol. I. Chap. II.

When treating of the method of applying ligatures to arteries, in the firſt volume of this work, I gave it clearly as my opinion, that it may be beſt done by the tenaculum, an inſtrument repreſented in Plate I. fig. 1. And after much additional experience of its utility, I now think it right to ſay, that I am more and more convinced of its being much ſuperior to the needle; which cannot be uſed without a portion of the contiguous ſoft parts being included in the ligature; a cirumſtance which in every inſtance we ſhould endeavour to avoid. Many imagine that the tenaculum may be uſed with ſafety in the application of ligatures to arteries of a middling ſize, while they are afraid of cutting thoſe of a ſmall ſize aſunder, if ſome of the contiguous cellular ſubſtance be not included along with them: and in tying the large trunks of arteries, they ſuſpect that the ligatures would be apt to be forced off by the ſtrong pulſations of theſe veſſels, if they were not ſupported by being firmly fixed in the contiguous parts. I have not, however, had a ſingle inſtance of obſerving that either of theſe objections to this practice is well founded. For a number of years paſt, I have laid aſide the needle, for the purpoſe of applying ligatures to arteries, almoſt entirely; and in the courſe of that time, I have employed the tenaculum indiſcriminately in hemorrhagies from arteries of all ſizes.

Wounded arteries are ſeldom ſo ſituated as to prevent the hemorrhagy from being ſtopped in the manner we have mentioned: for when they lie at the bottom of deep wounds, with narrow contracted mouths, the wound may commonly be enlarged ſo as to admit of their being tied with ligatures; and for the moſt part it may be done with ſafety. Where the enlargement of a wound is not clearly neceſſary, no perſon of experience would adviſe it; but the practice is always ſafe and proper in hemorrhagies proceeding from arteries lying ſo deep that ligatures cannot otherwiſe be applied to them. As this practice, however, has been very inadvertently condemned by ſome practitioners in a general way, from their ſuppoſing it to be rarely if ever neceſſary; a timidity has been thereby introduced, which in various inſtances has been the cauſe of miſchief: Patients have been tormented with the application of tight bandages, and with the trial of different ſtyptics which ſeldom if ever ſucceed, when the hemorrhagy might have been ſtopped in the moſt effectual manner by a ſmall enlargement of the wound: Nay, many limbs have been amputated from the ſame cauſe, which might eaſily have been ſaved; particularly in caſes of compound fracture, where a hemorrhagy, proceeding from a deep ſeated artery which cannot be eaſily tied, is too frequently conſidered as a ſufficient reaſon for removing the limb. From particular circumſtances, in a few caſes of compound fracture, it may happen that hemorrhagies cannot be ſtopped without laying the injured parts ſo extenſively open, as might induce more hazard than amputation itſelf. This, however, is a very rare occurrence; and it will ſeldom take place where the caſe has been properly treated from the beginning.

When the injured artery runs in the ſubſtance of a bone, no ligature, it is evident, can be applied to it; and, therefore, in ſuch a caſe, enlarging the wound could not be attended with much advantage. But arteries in this ſituation are never ſo large as to lead us to be much afraid of any hemorrhagies that may proceed from them; nor does it often happen that they continue to bleed long after they have been completely divided. An artery thus ſituated, being merely wounded, may diſcharge a great deal of blood; but I have met with different inſtances of the hemorrhagy ſtopping almoſt immediately on the veſſel being cut acroſs. Authors indeed have ſaid, that the utmoſt danger has been induced by arteries ſurrounded with bone being wounded; nay, that death itſelf has happened from this cauſe, owing to the impoſſibility of including them in ligatures. I am convinced, however, that it is a partial diviſion only of ſuch arteries that will ever produce hemorrhagies of any importance; for they are always ſmall, and they never adhere ſo firmly to the ſurrounding bone as to be prevented from contracting on being freely divided.

Where the diſcharge of blood proceeds from large veſſels, the means we have mentioned are the moſt effectual for putting a ſtop to it. But when it occurs from an infinite number of ſmall arteries over the whole ſurface of the wound, other remedies muſt be employed. We muſt refer, however, to a former chapter of this work, where this ſubject was more fully conſidered *.

The hemorrhagy being ſtopped, the next object requiring our attention is the removal of any extraneous body that may have been admitted: and where ſuch ſubſtances are not deeply ſeated, this is always done both with moſt eaſe and ſafety with the fingers alone; for when forceps and other inſtruments are employed, we can ſcarcely fail to injure the contiguous parts.

The examination of wounds, with a view to diſcover extraneous bodies, ought to be made with much caution and delicacy; for, handling the parts roughly, gives unneceſſary pain, and is apt to induce a degree of inflammation, which often proves hazardous.

But although it is always proper to accompliſh the removal of extraneous bodies with as little pain to the patient as poſſible; yet wherever we have any certainty of bodies of this kind being lodged,

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* Vide Vol. I. Chap. II. Section II.

ed, we ought by all means to proceed with firmneſs, in the firſt place, in diſcovering their ſituation, and afterwards in removing them, excepting in a few particular caſes where this cannot be done without much riſk of injuring parts of real importance to life. In ſuch caſes the judgment of the practitioner muſt always decide between the danger that may probably enſue from the extraneous body being allowed to remain, and that which may ariſe from his proceeding to remove it immediately.

Modern authors in general ſtrictly forbid much aſſiduity in the removal of bodies of this kind; for they very properly obſerve, that in former times much miſchief was done by exploring wounds with more exactneſs than was requiſite; by which unneceſſary pain was induced, and cures rendered more tedious than they otherwiſe would have been.

But in this matter the moderns ſeem to have gone from one extreme to another: for although much handling of ſores, and a free uſe of probes, forceps, and other inſtruments, are ſeldom neceſſary, it is equally true, that by allowing extraneous bodies, which might have been removed at firſt, to remain in wounds, much future pain and inflammation have been occaſioned.

In ſupport of this practice we are told, that various caſes are on record of extraneous bodies continuing to lodge in different parts of the body without any inconvenience; that this will commonly happen when the ſubſtance is not of a ſtimulating nature; and that when it is of ſuch a form or texture as to induce pain, that it will ſoon excite ſuch a plentiful ſuppuration as will quickly throw it out in a much more eaſy manner than if it had been removed at firſt. In anſwer to this, I ſhall obſerve, that where extraneous bodies in wounds cannot be removed without giving the patient a great deal of pain; and eſpecially where there is any riſk of large contiguous blood-veſſels being wounded by it; we ought by no means to attempt their removal. In ſuch caſes we ought certainly to truſt to the ſubſequent ſuppuration, for throwing them out: But they ought always to be taken out immediately when it can be done with tolerable eaſe, or without injuring any parts of importance. In this way we obtain a more expeditious cure, and we accompliſh our purpoſe in an eaſier manner, than could be done in any future ſtage of the ſore. For in a recent wound, while no inflammation or tenſion takes place, the contiguous parts eaſily ſtretch and yield to the extraction of any ſubſtance that may be lodged in them, if it be not of an angular form, and if the operation, inſtead of being performed quickly, be done with ſlowneſs and caution: whereas, when the contiguous parts become ſtiff and painful, which they always do in the courſe of a ſhort time, any ſubſtance lodged in them is removed with much pain and difficulty: for even after a free ſuppuration has taken place, although the parts will be conſiderably relaxed, yet ſtill they will be more ſtiff and tenſe than they were at firſt; and the opening through which the ſubſtance is to be extracted will likewiſe be much diminiſhed.

We gain another very material advantage by the immediate removal of extraneous bodies from wounds. While a ſore is ſtill recent, almoſt every patient will allow every thing being done which the practitioner in attendance may think neceſſary; but they frequently refuſe, in future ſtages of the ſore, to ſubmit to any thing beſides the uſual dreſſings.

It may be remarked in this place, that of the extraneous bodies that are apt to be lodged in wounds, ſome are more harmleſs than others. A prudent practitioner will therefore be more or leſs anxious in attempting to remove them. Thus we all know, that a lead-ball may be lodged very deeply, for a great length of time, without being productive either of pain or inconvenience; while a ſplinter of wood, glaſs, or iron, or even a bit of cloth, will often create a great degree of uneaſineſs. When therefore it is known that a lead-ball is the only ſubſtance that is lodged, if it cannot be eaſily removed, we have at leaſt the ſatisfaction of being aſſured that it will not probably do much harm. We will therefore allow it to remain, either till it be looſened by a plentiful ſuppuration, or till ſome future period, when it may perhaps be diſcovered in a different ſituation, ſo as to be taken out with ſafety at a counter-opening: While, on the other hand, when ſuch ſubſtances are lodged in wounds as will probably excite much irritation and pain, it will be much for the intereſt of the patient, and will be the means of preventing much perplexity and trouble to the ſurgeon, to have them removed as ſoon as poſſible after the injury is inflicted.

We have obſerved above, that in removing extraneous bodies from wounds, it ſhould be done with the fingers alone, rather than with forceps. Some few exceptions may occur to this, which we ſhall afterwards have occaſion to mention. But ſubſtances are ſometimes lodged in wounds that cannot be eaſily taken out either with the fingers or forceps. This is particularly the caſe with ſand, duſt, and ſmall pieces of glaſs. Theſe are beſt removed by bathing the parts in warm water, or by pouring water upon them; ſqueezing it gently from a ſponge, or injecting it ſlowly with a ſyringe.

In performing even this very ſimple operation of waſhing a wound, as well as in extracting foreign ſubſtances either with the forceps or in any other way, it is proper to obſerve, that much advantage may be derived from placing the patient in ſuch a poſture as tends moſt effectually to relax the injured parts, ſo as to obtain as wide a ſeparation as poſſible of the lips of the wound. I have ſeen different inſtances where, from want of attention to this circumſtance, patients have ſuffered much unneceſſary pain; where, after various trials, the practitioner has been obliged to deſiſt without accompliſhing his object; and where another practitioner has proved at once ſucceſsful, merely by putting the wounded parts in a relaxed poſition.

After paying due attention to the circumſtances reſpecting extraneous bodies lodged in wounds, our next object is the conduct of the cure.

In inciſed wounds, a ſeparation of the parts that have been divided takes place; and as every wound proves a cauſe of irritation, the ſeparation which at firſt appears, continues for ſome time to increaſe, merely by the contractile power of the injured muſcles. In the uſual way of covering wounds with lint, or with pledgits of ointments, and where the parts have not been previouſly drawn together and retained in their ſituation, an effuſion of a ſerous fluid ſoon takes place from the great number of ſmall veſſels that have been cut. This is afterwards converted into purulent matter: in a ſhort time the ſore is found to be covered with an infinite number of ſmall ſprouts or granulations;

nulations; and theſe having advanced to a certain extent, a dry pellicle of ſcarf-ſkin, termed a Cicatrix, forms over the whole extent of the wound, and thus the cure is completed.

This is the manner in which the healing of wounds is effected, when nature is not aſſiſted by art, or when her operations are only promoted by proper coverings and protection to ſuch parts as are injured. But although, in ſome caſes, this is our only reſource; and although even in this way practitioners have it always in their power to forward the cure of ſores; yet it is liable to many very important objections, which may be obviated by a different treatment.

When a wound is healed in this manner, if the parts which have been divided have ſeparated to any conſiderable extent, the ſuppuration which enſues will be plentiful; by which, if the conſtitution is weak, the patient is apt to be materially injured. In extenſive ſores, this method of cure is always tedious: When deep muſcular parts are injured, the motion of the contiguous joints is apt to be affected, by the divided parts healing when too far ſeparated from each other. And the cicatrix of a large wound, when cured in this manner, is always ſtiff, unſeemly, and diſagreeable: nor is it poſſeſſed of that ſtrength and firmneſs which the parts beneath require for their protection.

Patients, however, are ſeldom under the diſagreeable neceſſity of ſubmitting to theſe inconveniences: for in general, wounds may be cured in a much more eaſy as well as in a more agreeable manner. We know from experience, that two inflamed ſurfaces of an animal body, when kept in contact, will ſoon adhere together. This was probably at firſt pointed out by accident; but practitioners now derive much advantage from it in various operations, as well as in the treatment of accidental wounds. By drawing ſuch parts as have been divided, into contact with each other; and eſpecially by taking care to have them all as completely covered as poſſible with the cutis vera, very extenſive wounds are often quickly cured; the power of moving and of uſing limbs with freedom is often preſerved which otherwiſe would be loſt; the ſcar or mark which remains is ſeldom of any importance; and the wounded parts have the advantage of being ſufficiently protected.

The fact has been long known with reſpect to this point, for there is nothing more certain, than that parts recently divided, will unite firmly together, if they be kept in contact for a ſufficient length of time. The cauſe, however, of this phenomenon has not hitherto been rendered clear. The prevailing idea is, that it proceeds from a direct inoſculation or junction of the different parts that have been divided; and that thoſe parts only will adhere together which were formerly united. Thus it is imagined in the healing of wounds in this manner, that a divided artery on one ſide of a cut muſt be made to adhere directly with its fellow on the oppoſite ſide; that veins muſt unite with veins; muſcular fibres with fibres of a ſimilar nature, &c. But although it is neceſſary in practice to keep this idea ſo far in view, as to be at much pains to place parts that are to be healed as exactly oppoſite to each other as poſſible; yet this proceeds more from a requiſite attention to ſymmetry and neatneſs in the external parts after the cure, than from any other cauſe: for it is certain, that no ſuch exactneſs is required for the mere adheſion of the divided parts; and whoever doubts of the fact, may with little difficulty prove it experimentally. A membrane may be made to adhere to a bone; and the divided end of an artery or a vein will unite with almoſt any ſubſtance with which it is kept in contact.

It is indeed true, that blood circulates through the cicatrix of a wound; a fact which few will doubt, and which probably gave riſe to the opinion we are now conſidering. But we have reaſon to believe

lieve that this circulation does not take place immediately on the formation of a cicatrix. It ſeems rather to be an after-proceſs of nature, and is evidently accompliſhed by an infinite number of ſmall vaſcular ſprouts or newly created blood-veſſels, which proceed from the larger arteries and veins on each ſide of the wound, and inoſculate with each other ſo as to give a ſufficient circulation in the parts through which they paſs. At leaſt I have found, in different inſtances, on examining the cicatrix of a large wound, that it was always very vaſcular; and I conclude, that it happens from a new formation of ſmall blood-veſſels, as the divided extremity of every blood-veſſel, whether artery or vein, when of ſuch a ſize as to be eaſily diſtinguiſhed, is always ſhut, and even obliterated for a certain ſpace, from the point where the injury happened, in the ſame manner as in arteries that are tied with ligatures, in caſes of amputation and other capital operations. And if this happens in veſſels of a large ſize, there is alſo reaſon to ſuppoſe that it does ſo in thoſe that are ſmaller.

In confirmation of this opinion, we may obſerve, that a circulation of blood betwixt adhering ſurfaces takes place where inoſculation of the kind in queſtion can never occur, from no previous diviſion of blood-veſſels having been made. Thus when the ſkin of two contiguous fingers or toes becomes raw or tender, without any blood-veſſels being injured, it is difficult to prevent them from adhering; and when they do adhere, a free circulation is afterwards found to take place between them. Other inſtances might be adduced; but I notice this one, as it is not unfrequent, and as it is perfectly applicable to the preſent queſtion.

I therefore conclude, that wounds cured in this way are healed in the ſame manner as the adheſion of inflamed ſurfaces is formed, namely, in conſequence of exſudation, from the extremities of the divided veſſels, of the glutinous parts of the blood; which in the firſt place retains the parts together, and afterwards ſerves to ſupport the new formation of ſmall blood-veſſels which nature puts forth as a farther and more certain means of retention.

I have entered into this phyſiological diſcuſſion, imagining that it tends to eſtabliſh a material point in practice. It has commonly been ſuppoſed, that the ſpace of twelve, fourteen, or fifteen days, is neceſſary for the complete adheſion of divided parts: a ſuppoſition which proceeds upon the idea that this adheſion is formed ſolely by the inoſculation of blood-veſſels. But if aglutination alone is neceſſary, in the firſt inſtance, to accompliſh this adheſion, it is evident that it muſt be effected ſooner. Accordingly, I have uniformly found divided parts adhering firmly about the fifth day; and have known the bandages accidentally removed from wounds on the ſecond and third days, without ſeparation of the parts newly united being the conſequence. From this it appears, that a ſhorter application of the uſual means of retention will anſwer than is commonly practiſed. Surgeons term this treatment of ſores, Healing by the Firſt Intention; and as it is in every reſpect the moſt deſirable method of cure, it ſhould always be followed when practicable.

In other varieties of wounds, different reaſons often occur to prevent us from curing them in this manner. Theſe we ſhall afterwards have occaſion to mention. But in the ſimple inciſed wound, where the injury has been inflicted with a clean-cutting inſtrument, without producing puncture, laceration, or contuſion, the only objection that can occur to it, is our not being able to draw the divided parts into contact, and to retain them in that ſituation till they adhere together. This, however, will ſeldom happen, unleſs a loſs of ſubſtance takes place to a conſiderable degree. Where a large portion of ſkin, with the muſcles beneath, has been entirely cut out, it may in ſome caſes be impoſſible to bring the retracted edges of the wound together; but we may always make them approach ſo as to diminiſh the ſize of the ſore, and may thus have it in our power in every inſtance to forward the cure. In deep tranſverſe wounds, even where no ſubſtance is loſt, the retraction is often ſo great, as to render this practice ſomewhat difficult: But by placing the injured part in that ſituation which tends moſt effectually to relax the divided muſcles, we may effect our purpoſe almoſt in every inſtance. It is indeed ſurpriſing to ſee how completely divided parts will be made to approach, which, while the muſcles were upon the ſtretch, were ſeparated to a conſiderable diſtance from each other. We ſhould not therefore deſpair too ſoon; for even in the worſt caſes we ſeldom fail by due perſeverance to produce ſome very eſſential advantage.

When it is found that the divided

parts may be drawn together, we have next to fix upon the beſt and eaſieſt method of retaining them in this ſituation during the cure. There are various means propoſed for this; namely, bandages of different kinds, adheſive plaſters, and ſutures.

The ſides of wounds of a longitudinal direction, ſituated in any of the extremities, and of ſome wounds of the head, may be retained by the uniting bandage. But it ſeldom anſwers in the trunk of the body; nor can it ever prove uſeful in wounds, either in the legs or arms, of a tranſverſe direction: And even where there is reaſon to imagine that it will anſwer ſufficiently well for retaining the ſides of the wound in contact; yet we ought never to truſt to it entirely; for we cannot depend upon it with any certainty for preſerving the ſkin ſmooth and equal: a circumſtance of much importance in the cure.

The eaſieſt method of retaining the ſkin exactly in its ſituation, is by means of adheſive

PLATE LXVII

FIG. 1.

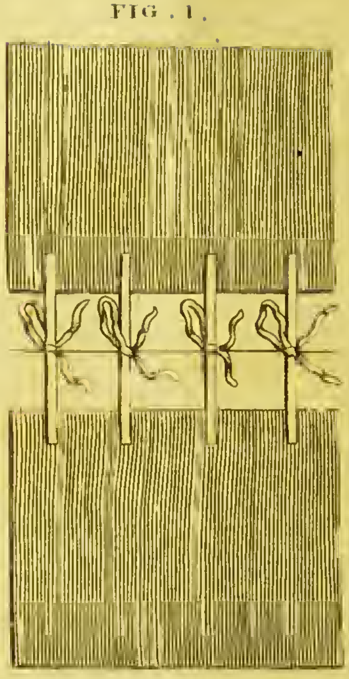


FIG. 2.

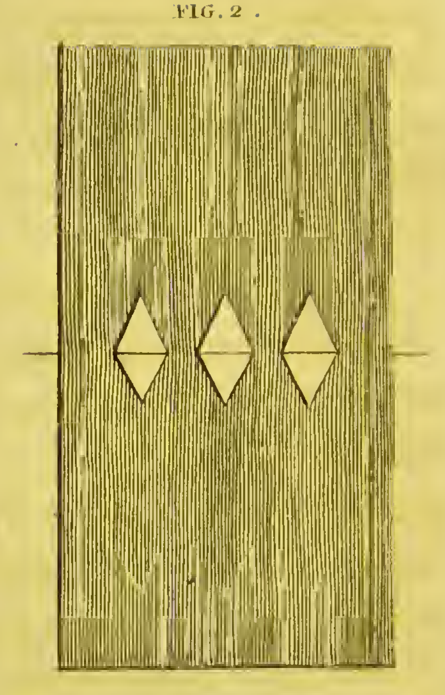


FIG. 3.

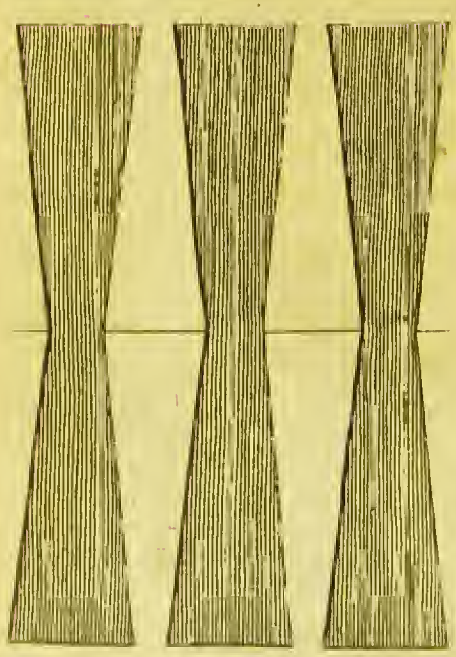
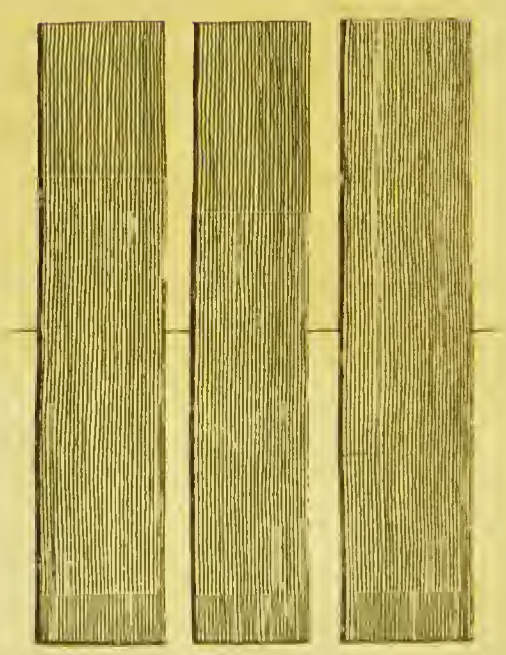


FIG. 4.



heſive plaſters applied in the manner repreſented in plate LXVII. In ſome caſes plaſters alone will prove ſufficient; but when much retraction is expected, the uniting bandage ſhould be applied over them whenever the direction of the wound renders it admiſſible.

Many practitioners, in every inſtance of wound, prefer adheſive plaſters to the uſe of ſutures; but it is in particular caſes only that this preference is proper. Adheſive plaſters may be uſed with advantage in ſuperficial wounds that do not penetrate much deeper than the cellular membrane: and where there is ſuch a loſs of ſubſtance as prevents the ſides of a wound from being drawn cloſe together, they may be employed for the purpoſe of retaining the retracted parts as near to each other as they can be eaſily brought. But in all wounds that penetrate to any conſiderable depth, and when their edges can be drawn into contact, the twiſted ſuture is by much the moſt effectual means of retaining them. For a deſcription of this and other ſutures, we muſt refer to Volume I. Chapter I. The common interrupted ſuture is indeed more frequently employed than the other; but it does not ſupport the parts with ſuch certainty: the ligatures are more apt to tear or cut out the parts which they ſurround; and they frequently leave diſagreeable marks.

On this ſubject it is the common opinion, that adheſive plaſters and ſutures are admiſſible only in the recent ſtate of wounds. But however deſirable it may be, for various reaſons, to have the application of either made as early as poſſible; yet where they have been neglected at firſt, they may be employed with advantage during any ſtage of the ſore: for we are wrong in ſuppoſing, as is commonly done, that wounded parts will not adhere when in a ſtate of purulency. I have repeatedly treated, in this manner, ſores of two, three, and four weeks duration, and always with advantage: Inſomuch, that I believe the practice will very commonly ſucceed in every ſtage of a ſore when the retracted edges can be brought together.

Whether we employ adheſive plaſters or ſutures, we ſhould be very attentive in ſupporting the parts, as far as it can be done, by the poſture of the patient; for if this be neglected, ſutures of every kind will yield ſo as not to anſwer the purpoſe: And along with this, when plaſters are uſed, a farther advantage, as we have already obſerved, may be derived from a proper application of the uniting bandage; but for the reaſons given in the chapter on Sutures, and again when treating of the Hare-lip in Chap. XXIX. Vol. IV. neither this nor any other bandage can with propriety be employed with the twiſted ſuture.

When a wound is treated in this manner, as ſoon as the retracted edges are drawn together and properly ſupported, whether by plaſters or ſutures, no other dreſſings are neceſſary, excepting ſome thin covering of ſoft lint to protect the parts beneath from cold; and with a view to prevent as much as poſſible any acceſs to air, the lint ſhould be ſpread either with ſome unctuous ſubſtance, or with mucilage of any inoffenſive gum.

This being done, the patient ſhould be enjoined to preſerve the injured parts in the poſture that is judged moſt favourable; and care ſhould be taken to put him under proper regulations with reſpect to diet. If he is low and emaciated, he may with propriety have a ſmall allowance of light nouriſhing food; but if he is in any degree plethoric, or liable to inflammatory affections, if the wound is of any conſiderable extent, a ſtrict antiphlogiſtic courſe will be abſolutely neceſſary: for although inflammation to a certain extent be highly neceſſary for the cure of the wound; yet a prudent practitioner will always guard againſt exceſs of inflammation, as productive of much miſchief.

In open wounds, one of the moſt effectual applications for removing extreme degrees of inflammation, is warm emollient cataplaſms; but as they tend to induce the formation of matter, and as this would be directly oppoſite to our views in adopting the mode of cure we are now conſidering, it is evident in ſuch circumſtances that they are altogether unapplicable. But although warm emollients cannot with propriety be employed; yet much advantage may be derived from a prudent uſe of any cold emollient oil or unguent. When the attending ſymptoms of pain and inflammation continue moderate, the dreſſings ſhould never be removed till the cure be completed; but whenever the pain becomes ſevere, as it would probably, if neglected, terminate in a conſiderable degree of inflammation, by which our intention might be fruſtrated, the dreſſings ſhould be immediately taken away, ſo as to admit of the pained parts being freely rubbed or even bathed with an emollient. By repeated applications of this kind, I have ſeen different inſtances of very diſtreſſing degrees of pain being much alleviated, and of the contiguous parts being ſo much relaxed, as to admit of the cure by adheſion going on without interruption. In ſome caſes, however, we are under the neceſſity of employing other means; and of theſe the moſt effectual are opiates and blood-letting, particularly local blood-letting by means of leeches; which often proves effectual in removing pain and inflammation, when every other application has been tried in vain.

In general, a continuation of theſe means will anſwer the purpoſe: but it ſometimes happens, that notwithſtanding all our endeavours, the pain and inflammation increaſe, and the tenſion of the wounded parts becoming more conſiderable, the plaſters or ligatures with which they have been kept together muſt be taken away, otherwiſe they will do miſchief; and at laſt will yield, ſo as to be productive of no advantage whatever. In ſuch circumſtances it is better to remove them at once; and for the moſt part this will give the patient immediate relief: the pain and tenſion will ſoon diſappear; and a cure will be accompliſhed in the ordinary way: for it might prove hazardous to attempt the ſame method of treatment again.

By theſe means the bad conſequences now mentioned may be obviated: But it is proper to remark, that ſymptoms of this kind are not frequent. In general, the cure goes on without interruption; and where this is the caſe, our views are completed as ſoon as there is reaſon to ſuppoſe that a firm adheſion has taken place between the edges of the wound. We have already remarked, that this proceſs is commonly effected in a ſhorter time than is uſually imagined. In ſuperficial wounds, the ligatures, or other means of retention, may be removed ſooner; but even in deep extenſive wounds, when the habit of body is ſound, they may with ſafety be taken away on the fifth or ſixth day: for by this time all the advantage that can be derived from them will be gained; while much inconvenience, and ſome miſchief, may ariſe from their being allowed to remain longer.

We have already mentioned many of the advantages which reſult from this method of curing wounds. Indeed they are ſo great, that there ſhould be no heſitation in attempting it almoſt in every inſtance: for even when it fails, we are certain that any troubleſome ſymptom that may be induced by it, will be removed by due attention to the means we have mentioned; while much time will be gained when it ſucceeds. Two objections are commonly made to this mode of treatment, which we ſhall ſhortly mention. It is ſaid, that the ligatures with which it is often neceſſary to ſecure the arteries, will act as extraneous bodies, and prevent the ſides of the wound from uniting. And it is likewiſe obſerved, that in the courſe of the cure matter is apt to form; from the lodging of which, troubleſome ſinuſes are produced. Neither of theſe objections, however, is in any degree well founded; at leaſt, I have never met with a ſingle inſtance of either of them. It ſeldom happens that more than one or two arteries in any wound are ſo large as to require to be tied: but I know from experience, that wounds may be cured by drawing their edges together, even where a conſiderable number of arteries have been ſecured by ligatures: for the threads occupy very little ſpace; and when they are applied with the tenaculum, which ought always to be done, they are eaſily removed without any diſturbance being given to the other parts of the wound. And again, with reſpect to ſinuſes being apt to form from this method of treatment, if the edges of a wound be only drawn together above, a cavity will thus be formed beneath, where matter will no doubt be apt to lodge; but this ſhould not be attributed to the method of cure, but to the mode of putting it in practice: for in every wound which ought to be treated in this manner, the whole of the ſides or edges may be drawn together from top to bottom; and by this means the formation of ſinuſes prevented.

We have now to ſpeak of thoſe wounds which do not admit of this mode of treatment. When the edges of a cut cannot be drawn together, after the hemorrhagy is ſtopped and extraneous bodies removed, we find by experience, that the moſt effectual aſſiſtance we can afford, is to promote as much as poſſible the formation of matter: for the fact is undoubted, in every wound of this kind, that a free ſuppuration proves the moſt effectual relief to every ſymptom; at the ſame time that it appears to be ſo materially connected with the cure, that the healing proceſs never begins till the ſore is covered with good pus; a circumſtance by no means difficult to account for. The cure of ſores healed in this manner, is ſo far effected by nature alone, that although ſome advantage may be derived from art, yet the chief object of practitioners is to remove ſuch impediments as might tend to obſtruct the operations of nature, and to protect the injured parts till the cicatrix becomes ſufficiently firm. Now, as we know that a ſore will never be covered with granulations, or be cicatriſed, as long as it is very painful; and as nothing with which we are acquainted proves ſo mild an application to wounds as pus, we may conclude, that it is chiefly uſeful by preſerving the injured parts in that eaſy, pleaſant ſtate, which ſeems to be indiſpenſably neceſſary for the cure of every ſore. It ſhould therefore be our firſt object, in treating ſores in this manner, to forward the formation of pus as quickly as poſſible; and the moſt effectual method of doing it is, by treating every wound in the ſame manner as we do a common phlegmon; namely, by a free uſe of warm emollient poultices and fomentations. In the firſt place, the parts ought to be immediately covered as completely as poſſible, ſo that they may be protected effectually from the admiſſion of air. When the pain which occurs is exceſſive, poultices may be directly applied, as being the ſureſt means of relieving it: but, when the pain is moderate, it is better to delay the uſe of emollients for a day or two; for as pus cannot be produced till a ſerous effuſion has firſt taken place, and as we know that ſome degree of inflammation is required for effecting this, when the pain and tenſion in wounds are inconſiderable, an immediate application of poultices is apt to do harm, either by preventing altogether, or by retarding and rendering too languid that inflammatory affection which is ſo highly neceſſary for the cure. But in every inſtance of wounds of any conſiderable extent, remedies of this kind prove always uſeful after the firſt two or three days have elapſed: for by this time a ſufficient degree of inflammation has commonly taken place for effecting the wiſhed for effuſion; and we have elſewhere had various opportunities of ſhowing, that in no way whatever can this be ſo readily converted into purulent matter as by a free application of heat; ſo that whenever this remedy is judged to be proper, it ſhould be uſed to the ſame extent as we commonly find to be neceſſary in every caſe of abſceſs.

It is proper, however, to remark, that ſome caution is required in the uſe of this remedy: for although heat, whether conveyed by means of poultices or fomentations, is perhaps the moſt uſeful application in the ſtage of wound we are now conſidering; yet a long continuance of it is very apt to do miſchief, as we have daily opportunities of obſerving where it is employed by thoſe who do not conſider upon what principles it acts in proving ſerviceable. When the purpoſe we have mentioned is gained, namely, a free and kindly ſuppuration, as it is for this only that poultices are uſed, they ſhould now be laid aſide: for when continued longer, they almoſt conſtantly do harm, by relaxing the parts to which they are applied too much; by which they are apt to become pale, ſoft, and ſpongy, inſtead of being of a healthy red colour, and of a conſiderable degree of firmneſs. Nay, they are at laſt often productive of the very contrary effect for which they are employed: for although much inflammation proves always hurtful in the cure of wounds, yet in ſome degree it is in every caſe neceſſary. Now, by continuing the uſe of warm emollients too long, this ſalutary degree of inflammation is ſo entirely carried off, that the matter becomes thin and in too great quantities. And thus troubleſome vitiated ſores are produced, which a different management might have prevented. The period at which the uſe of poultices and other warm applications ſhould be laid aſide, muſt be determined in every caſe by the judgment of the practitioner; but this general rule may be ſafely adopted, That they may at all times be perſiſted in as long as much pain and inflammation continue; but theſe ſymptoms becoming moderate, the diſcharge being good, and the ſurface of the wound covered with granulations of a healthy appearance, they ſhould now be laid aſide. In this ſtate of a ſore, all the advantages are gained which poultices can produce; and a longer continuance of them might occaſion ſome of the inconveniences we have mentioned.

With reſpect to the moſt proper dreſsings for wounds, as we have conſidered this ſubject elſewhere*, it will not be neceſſary to treat of it at preſent with that minuteneſs which otherwiſe would have been proper.

We have already had different opportunities of remarking, that a certain degree of inflammation is neceſſary in the cure of every ſore; but as this very rarely proves deficient, and as there is more to be dreaded from its proceeding too far, eſpecially in the firſt ſtages of large wounds, the mildeſt dreſſings only ſhould be employed. During the progreſs of the cure, much advantage indeed may ſometimes be derived from the applica-

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* Treatiſe on Ulcers, &c. Part II.

tion of dreſſings of an irritating, or even of an eſcharotic nature. This, however, is only the caſe when a wound has advanced to the ſtate of an ulcer. While a wound is yet recent, there cannot be a doubt of the mildeſt applications being the beſt. In this country, ſoft dry lint is commonly employed, and by ſome pieces of ſoft ſponge are recommended; and it muſt be admitted, that they anſwer much better than any of the irritating balſams which till of late were ſo univerſally uſed, and which in moſt parts of Europe are ſtill continued: for it was in Britain that mild dreſſings to wounds were firſt introduced; and it is in this country only where even yet they have been generally received. But although dry lint is an eaſy mild application when compared with many others, yet it is certain that it always creates ſome degree of pain and irritation on being firſt applied; and it is apt to adhere to the edges of a wound, ſo as to cauſe ſome pain and difficulty on being removed. With a view to prevent theſe inconveniences, it ſhould be thinly ſpread with ſome mild emollient ointment; ſuch as Goulard's cerate, or the Unguentum Simplex of the Edinburgh Diſpenſatory. By this means it gives no pain in the application, and it is removed with eaſe, at the ſame time that it ſerves more effectually than dry materials to prevent the air from finding acceſs to the ſore. As dry lint, however, has long been very generally employed in this country, any innovation will not be readily admitted; but what I have adviſed being the reſult of a good deal of experience, I can with confidence recommend it.

A piece of ſoft lint, ſpread with any ointment of this kind, being laid over the wound, a bolſter of fine tow ſhould be applied above it for the purpoſe of keeping the parts warm, as well as for abſorbing any matter that may be diſcharged; and this being covered with a compreſs of old ſoft linen, the whole ſhould be retained by a bandage of fine flannel, which is preferable to linen, in ſo far as it is more agreeable to the feelings of the patient, and as it yields to any accidental ſwelling or tumefaction of the neighbouring parts: whereas linen, poſſeſſing little or no elaſticity, is very apt to do miſchief, by remaining ſtiff and immoveable, notwithſtanding any ſwelling that may enſue.

Practitioners are not agreed reſpecting the time at which the firſt dreſſings of ſores ſhould be removed; and nothing deciſive can be ſaid on the ſubject, as in ſome meaſure it muſt be directed by the circumſtances of every caſe. This general rule, however, may be properly adopted, that a ſore ſhould always be dreſſed when it is found to be plentifully covered with matter. This will generally be the caſe about the fourth or fifth day; but as the formation of pus depends upon different circumſtances, particularly upon the health of the patient, and upon the degree of heat in which the parts have been kept, ſome latitude muſt be allowed in this matter. A free uſe of poultices, after the ſecond day, puts it in our power to remove the dreſſings much ſooner than we otherwiſe could do: for they not only promote the formation of matter, but they ſoften all the coverings that have been uſed, ſo as to admit of their being eaſily taken away.

When the cure of a wound goes on without interruption, the ſecond, as well as all the ſubſequent dreſſings, ſhould be preciſely the ſame as the firſt: for our object being ſtill the ſame, no variation, it is evident, can be neceſſary. As nothing proves more hurtful to ſores than expoſure to the air, one great object in our application of dreſſings is to prevent any inconvenience which might ariſe from this. And the ſame reaſon renders it neceſſary to change the dreſſings as ſeldom as is conſiſtent with cleanlineſs; and to be as expeditious as poſſible in the renewal of them. In general, however, no harm will occur from a daily dreſſing of wounds. They ſhould not, but in very particular circumſtances, be dreſſed more frequently; nor can it often be proper to dreſs them ſeldomer than this: for when matter is allowed to lodge for a longer time, the heat in which patients with large wounds are uſually kept, is apt to make it become putrid and offenſive. But as I have elſewhere had occaſion to ſpeak fully upon this ſubject, it is not now neceſſary to enter upon a more particular conſideration of it *. I ſhall juſt obſerve farther, with reſpect to the continuance of mild dreſſings to wounds, that it ought to be regulated by the progreſs of the cure. As long as it continues to advance, they ſhould be perſiſted in; but when the ſore aſſumes appearances in any degree morbid, ſome variety in the dreſſings will be highly proper; and the nature of any change that is to take place muſt be regulated by the particular ſituation of the affected parts. We muſt refer, however, for a more minute conſideration of this

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* Vide Treatiſe on Ulcers, &c.

this part of our ſubject to the different ſections in the Treatiſe on Ulcers alluded to above.

We have hitherto been ſuppoſing that none of the ſymptoms which take place are violent; in which caſe the cure of every wound will, for the moſt part, go eaſily on under the mode of management we have mentioned. But in ſome caſes the cure is not only much interrupted, but even much hazard is induced by the unuſual height to which ſome of the ſymptoms proceed; and theſe particularly are, pain, inflammation, and convulſive affections of different kinds. We ſhall therefore offer a few obſervations upon the means of obviating theſe ſymptoms, when they proceed to ſuch a height as to prove any interruption to the cure.

A wound cannot be inflicted without inducing pain: for even the ſlighteſt injury which can be done to any part of the body, muſt neceſſarily affect ſome of the ſmaller branches of nerves; by which pain, to a certain degree, will be induced.

It commonly happens, however, that any pain which at firſt takes place in wounds, is not ſo ſevere as to require any particular management; and in general, it ſubſides entirely upon the removal of any extraneous bodies which have been introduced; by protecting the injured parts with proper coverings; and by a plentiful formation of matter. But in a few caſes the pain continues violent after every uſual method of removing it has been attempted. Opiates in large doſes are in ſuch circumſtances more to be depended on than any other remedy; and they do not often fail in giving relief. But it frequently happens that their effect is only temporary, the pain being apt to recur after the ſtrength of the opiate is exhauſted.

In this event we are to ſearch with much care for the cauſe of the pain. It may proceed from ſome particles of extraneous matter which have not been diſcovered; from inflammation of the wounded parts; or from ſome portion of a nerve or of a tendon being partially wounded without being divided; or from irritation over the whole ſurface of the ſore.

We ſhould therefore, in the firſt place, examine the wound with attention, ſo as to be as certain as poſſible that no extraneous matter has found acceſs to it: for when pain is produced by any foreign body lodged in a wound, the removal of it will, for the moſt part, procure immediate relief; while no remedy that can be adviſed will have any effect as long as it is allowed to remain. When any thing of this kind is not readily diſcovered; or when the particles of any extraneous matter that may be lodged in a wound are ſo ſmall that they cannot be removed with the fingers; we have already adviſed the injecting of warm water, by which they will often be waſhed out when every other trial has failed. But when this does not ſucceed, it ſometimes

times anſwers to immerſe the wound for a conſiderable time, perhaps for an hour, morning and evening, in warm water, or in warm milk; by which particles of matter are ſometimes diſſolved and carried out, which would otherwiſe have continued to excite much uneaſineſs.

If no trial, however, which may be made for this purpoſe, ſhould prove ſucceſsful, we muſt look for ſome other cauſe of the pain; and it will often be found to originate from inflammation. When the external parts of a wound are inflamed, the cauſe of the pain is at once rendered obvious; for even the ſlighteſt degree of inflammation is very readily diſcovered. But it ſometimes happens that the perioſteum, and other deep ſeated parts, are affected in this manner without any external marks of it appearing. This, however, is only the caſe for ſome ſhort period after the inflammation has commenced: for even when it firſt attacks parts that are deeply ſeated, it commonly ſpreads in the courſe of a day or two, ſo as to be diſcovered outwardly; and when this does not happen, we may in general be directed to the cauſe, by the heat of the patient's body; by the ſtate of his pulſe; and by the degree of thirſt, which in every caſe of this kind are always increaſed.

When theſe general ſymptoms of fever run high, it is ſometimes neceſſary to take away conſiderable quantities of blood by one or more general blood-lettings. But for the moſt part this meaſure is not neceſſary, and our views are obtained with more certainty by local blood-letting from the edges of the wound by means of leeches. In ſuch circumſtances, indeed, no remedy will prove ſo ſucceſsful as the diſcharge of blood in this manner. I have long been in the daily practice of uſing it in every wound where inflammation proceeds to any height; and I have often ſeen great advantages reſult from it. In caſes of pain proceeding from this cauſe, I have known the application of a few leeches to the edges of a wound procure immediate relief, even where large doſes of opiates, as well as other remedies, had previouſly been tried in vain. And that it is not the quantity of blood, but the manner of diſcharging it, which proves ſucceſsful, is evident from this, that the pain is often relieved immediately on a few drops being taken away by means of leeches, which did not yield in any degree to the loſs of a conſiderable quantity by veneſection. In uſing leeches for this purpoſe, they ſhould be applied as near as poſſible to the edges of the wound; nay, when they will fix within the wound itſelf, the practice proves ſtill more ſucceſsful: but unleſs the inflammation be very deeply ſeated, this meaſure will ſeldom be neceſſary. It ſometimes happens, however, as we have obſerved above, that in deep wounds no inflammation of any importance appears externally, while the perioſteum is diſcovered to be much inflamed and very painful. In this ſituation nothing affords ſo much relief as ſcarifications made in the inflamed membrane, either with the ſhoulder of a lancet or with the point of a ſcalpel. Nor need we heſitate in putting them in practice, on the ſuppoſition of their being apt to produce exfoliations of the bone beneath. Inſtead of this, they tend more certainly than any other remedy to prevent them: for exfoliations ſeldom happen merely from the perioſteum being divided; of which we have daily inſtances in wounds penetrating to this depth, which are rarely attended with this effect; unleſs the bone itſelf be at the ſame time conſiderably injured. In different caſes I have ſcarified the perioſteum in the manner here recommended, which in the mean time tended always to remove the inflammation; while in no inſtance was it productive of any diſagreeable conſequences. On the contrary, there is nothing more apt to induce exfoliation than an inflamed ſtate of the perioſteum, when it is allowed to proceed to the length of ſuppuration: and we know no remedy by which this is with ſuch certainty prevented as by inciſions made in the inflamed parts, and carried to ſuch a depth as to remove the tenſion which commonly takes place.

After as much blood is diſcharged as may be judged proper, whether by leeches or ſcarifications, no application will prove ſo uſeful as warm emollient poultices and fomentations frequently renewed: for in ſuch circumſtances nothing will afford ſuch effectual relief as a plentiful ſuppuration being induced. We conſtantly obſerve, that as long as a wound remains dry on the ſurface, the parts are tenſe, much inflamed, and very painful; and that they become lax and eaſy as ſoon as they are properly covered with purulent matter.

For the moſt part, the means we have mentioned will be attended with the deſired effect; and eſpecially if the operator be not too timid in making the ſcarifications: for we muſt again obſerve, that they may be done with much more ſafety and freedom than is commonly imagined;

gined; and when membranes in any ſituation are much inflamed, nothing with which we are acquainted will ſo certainly prevent the acceſſion of gangrene as deep and free ſcarifications. Even this remedy, however, will not always ſucceed: for in ſome caſes the inflammation, inſtead of abating, becomes more and more violent, till at laſt it terminates in mortification. But as we have elſewhere treated fully of this ſubject, it is not at preſent neceſſary to enter upon it*.

When wounds are attended with violent pain, proceeding from inflammation, the cauſe is for the moſt part very readily diſcovered. But ſeverer pain ſometimes exiſts independent of inflammation: for although much pain very ſeldom fails to induce an inflamed ſtate of a wound at laſt, it will often ſubſiſt for a conſiderable time before this takes place. In ſuch caſes, and eſpecially where we have no cauſe to ſuſpect that it ariſes from the lodgement of extraneous matter, it will probably be found to proceed from the partial diviſion of a nerve or tendon: for we know, that in various inſtances the moſt excruciating pain has been induced in this manner.

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* Treatiſe on Ulcers, &c. Part I.

In ſome caſes, the pain produced in this way is effectually relieved by putting the injured parts into a relaxed ſtate; but, for the moſt part, the only remedy upon which we can depend is a complete diviſion of the wounded nerve or tendon: and as this is a means of cure which may at all times be practiſed without riſk, it ſhould never be delayed when the pain is found to proceed from this cauſe; and eſpecially when, from its violence, there is reaſon to ſuſpect that it may induce convulſions or any other alarming ſymptoms. As a free uſe of the ſcalpel, however, is neceſſary, patients in general do not eaſily ſubmit to this diviſion; nor do we commonly find that practitioners are apt to recommend it. But I can ſay from different inſtances of its beneficial effects, that we ought more frequently to practiſe it: for it ſeldom fails to afford immediate relief, even in the ſevereſt degrees of pain; and I never knew any bad effect reſult from it. It ought always, however, to be adviſed as ſoon as any other means that may be employed have failed: for when violent pain has ſubſiſted ſo long as to induce any material affection of the convulſive kind, even this remedy will not readily remove it. On the parts being freely divided, they ſhould be placed in a relaxed poſture; and an emollient poultice being laid over them, if the practice proves ſucceſsful, the patient will ſoon find himſelf relieved from his diſtreſs, and the wound may afterwards be treated in the uſual way. But when it fails, as it will be apt to do, when from timidity, or any other cauſe, it has been long delayed, there will be much cauſe to ſuſpect that the patient will at laſt die convulſed, notwithſtanding the uſe of opiates, and every other remedy that may be employed.

In ſome caſes again, the pain which occurs in wounds, inſtead of being deep ſeated, which it always is when it proceeds from an affection of any particular nerve or tendon, is found to originate from a peculiar degree of irritability of the nerves on the ſurface of the injured parts. The pain, in ſuch inſtances, is not very ſevere; but it often proceeds to ſuch a length as to excite much uneaſineſs, by which the patient is apt to be deprived of reſt, and the matter to be rendered ſharp and acrid.

For the removal of this kind of pain, emollient poultices, and other warm applications, are commonly employed; but ſeldom with any advantage. Indeed they often ſeem to increaſe the irritability. Large doſes of opium afford the moſt certain relief; and a ſolution of opium in water, or a weak ſolution of ſaccharum ſaturni, are the beſt external remedies. When of a proper ſtrength, they ſeldom fail in removing the pain.

While treating of the cauſe and removal

of pain in wounds, it was neceſſary to mention inflammation, with the means beſt adapted for the cure of it. We have now to attend to the nature and treatment of ſome convulſive affections which injuries of this kind ſometimes induce.

Subſultus tendinum, and other ſpaſmodic affections of a ſlight nature, are frequent conſequences of wounds; and are more particularly apt to occur from the amputation of limbs, when they often prove the cauſe of much uneaſineſs and pain: for the ſtarting which they are apt to excite in the affected limb, produces a violence of action which muſcular parts newly divided are not well fitted to ſupport. And when they are ſevere, and return frequently, they prevent the dreſſings from being kept properly applied, at the ſame time that they are often the cauſe of hemorrhagies from arteries which have even been tied with ligatures. We ought, therefore, in every inſtance, to treat them with attention. Indeed the riſk of their producing hemorrhagies is ſo conſiderable, and the ſenſations which they communicate to the patient are ſo diſagreeable, that a prudent practitioner will at all times conſider them to be of importance.

As theſe convulſive twitchings are evidently the conſequences of pain and irritation produced by the wound, it is obvious that thoſe means are moſt likely to prove effectual in removing them which are moſt powerful in procuring eaſe. Hence much advantage is derived from placing the patient's body, and eſpecially the affected limb, in the eaſieſt poſture: indeed more benefit is derived from it than we are often aware of. I have known ſevere degrees of this affection relieved almoſt immediately, by changing the poſture of a ſtump. But when this does not prove ſucceſsful, opiates will ſeldom fail.

It is worthy of obſervation, in uſing opium for this purpoſe, that it anſwers better to give it in ſmall doſes frequently repeated, than to give large doſes at once. The latter often produce ſickneſs, and even vomiting; and after their effects are over, the ſpaſms are apt to become more ſevere than they were at firſt; which we ſeldom find to happen when the remedy is uſed in ſmaller quantities.

There are other other convulſive affections, however, ſtill more alarming, which even in this country ſometimes occur from wounds, but which happen much more frequently in warm climates; the locked-jaw, and tetanus. Theſe affections proceed, in many inſtances indeed, from other cauſes, the nature of which we cannot diſcover: but when they are not obviouſly induced by deep or extenſive wounds, they may often be traced, by a more minute inveſtigation, to ſome ſlight injury done to the ſurface of the body. Even the ſlighteſt ſcratch, which does not penetrate to a greater depth than the ſkin, has been known to induce them.

As we know that ſevere degrees of pain are often productive of involuntary contractions of ſuch muſcles as have been injured, we would naturally expect that extenſive wounds would be frequently attended with this effect. But we do not ſo readily ſee how the moſt violent affections of this kind ſhould occur from ſuch wounds as are ſo ſlight as ſcarcely to be noticed, and which never of themſelves produced much uneaſineſs.

Nor do injuries of greater importance induce theſe ſymptoms ſo readily while they are recent and painful: for they ſeldom occur in large wounds till the cure is far advanced; and in ſome inſtances, particularly after the amputation of limbs, they are never more apt to appear than when the cicatrix is nearly completed. At leaſt this has been the caſe in almoſt every inſtance of this kind which I have met with in this country; and we are told from very certain authority, that the ſame obſervation has been made in warm climates *.

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* Vide Obſervations on the diſeaſes incident to Seamen, by Gilbert Blane, M. D. &c.

The cauſe of this may be difficult to explain; but our knowledge of the fact leads to ſome advantage in practice. We have hitherto been made to ſuppoſe, that the locked-jaw, and other convulſive ſymptoms which ſometimes ſucceed to wounds, are moſt apt to occur from the violence of pain induced at, or ſoon after, the time of wounds being inflicted; and therefore practitioners have guarded with moſt aſſiduity againſt them while the pain has continued ſevere. But when it is known that they ſeldom or never occur at this period, and that they frequently appear in more advanced ſtages of wounds, thoſe means of prevention which are found to prove moſt effectual, will more readily act with advantage if applied at this time.

Practitioners, therefore, in warm climates, ſhould be particularly attentive in the advanced ſtages of wounds; and the moſt effectual remedy which can be applied on the firſt appearance of a locked-jaw, is immerſing the patient, ſo as to cover the whole body, in a warm bath. The heat of the bath ſhould be regulated by the feelings of the patient; and he ſhould continue in it as long as he is able to bear it. Water is commonly uſed for this purpoſe; but where milk can be procured, it ſhould be preferred: for as a warm bath proves, in caſes of this kind, chiefly uſeful by its relaxing powers, we have reaſon to ſuppoſe that the oily particles contained in milk render it particularly proper; and the idea appears to be well founded by the beneficial effects which in different inſtances have reſulted from the uſe of it.

It may often happen, however, that milk cannot be procured in quantities ſufficient for this purpoſe. In ſuch ſituations, fat broths, or water combined with oil in any other manner, may be uſed inſtead of it. When one application of a bath proves ſucceſsful, the uſe of it need not be continued; but for the moſt part ſeveral repetitions of it are neceſſary. Nor are we to imagine that warm bathing is a certain remedy. It has frequently indeed proved highly uſeful, and many cures have been accompliſhed by it; but we muſt likewiſe confeſs that it has often failed, and that patients are daily carried off in warm climates by the locked-jaw, and other convulſive ſymptoms, notwithſtanding the moſt ample application of the warm bath, and of every other remedy that has hitherto been employed.

The failure of warm bathing has induced ſome practitioners to make trial of the cold-bath; and in ſome convulſive affections it has certainly proved uſeful; particularly in univerſal tetanus: but as yet it has not been ſo frequently employed as to enable us to judge with preciſion, whether it will often prove uſeful or not in the locked-jaw; which we are to conſider as the moſt obſtinate as well as the moſt dangerous ſymptom of this kind.

At the ſame time that we perſiſt in the uſe of warm bathing, other remedies ought not to be neglected; and of theſe opium is the moſt certain. It proves uſeful both as an external application and as an internal medicine. By rubbing the contracted muſcles with laudanum, or by keeping them covered with an extract of opium, or with opium merely ſoftened with ſpirits or water, the ſpaſm has in ſome inſtances been leſſened: but the moſt effectual relief obtained from this remedy is by giving it inwardly; not in large quantities as we have remarked above; but in ſmall doſes, frequently repeated. The doſes ſhould be ſuch, however, as may effectually allay the pain and uneaſineſs produced by the diſeaſe; but more than this is unneceſſary: and, when exhibited in large quantities, it ſeems to do miſchief, by inducing that very ſtate of the ſyſtem it was meant to prevent, namely a great degree of irritability: for as ſoon as the operation of a large doſe of opium is over, we commonly find, in all ſpaſmodic affections, that the diſeaſe returns with double violence. But this may be eaſily prevented, by giving

ving ſuch doſes as the patient can eaſily bear, and repeating them at ſhort intervals, in ſuch a manner that the effects of one may not be over before another is given. Æther and muſk have ſometimes been conjoined with opium; but no advantage of importance has been derived from them.

We have mentioned opium as an external application; but the remedies of this kind from which we would expect moſt advantage are emollients, freely applied over all the contracted parts. The nature of the diſeaſe ſeems ſtrongly to point them out; and experience has, in ſome inſtances, ſhown that they may be uſed with advantage. Emollients of every kind may be uſed for this purpoſe; but animal fats of the ſofter kinds ſeem to be preferable: for they certainly prove more powerfully relaxing in all caſes of contracted muſcles than any of the vegetable oils; at leaſt, in the courſe of my experience, they have uniformly proved to be ſo. By boiling recent bones in water, a very pure oil of this kind is obtained; and the fat of all kinds of fowls anſwers well.

Mercurials have been frequently given in diſeaſes of this kind: but if mercury has ever proved uſeful, it has been in ſuch caſes only where it was rubbed upon the contracted parts in the form of an ointment, and where it would probably act with advantage as an emollient.

When a locked-jaw occurs from a wound in any of the extremities, if the diſeaſe does not yield to the remedies we have mentioned, it has been propoſed to amputate the member; and in various caſes this has been practiſed. I am ſorry, however, to obſerve, that we have ſcarcely an inſtance of its proving effectual: for in this diſeaſe, as in almoſt every ſpaſmodic affection, the effect is apt to remain after the cauſe is removed. We have therefore no encouragement, from paſt experience, to put this remedy in practice. Inſtead of proving uſeful, the diſeaſe has, in different inſtances, been evidently rendered worſe by it. The remedies therefore which we have to truſt to, are thoſe we have mentioned above, namely, the warm bath, opiates, and a very free application of emollients.

While we are depending on theſe for effecting a cure, the patient's ſtrength ſhould be ſupported by mild nouriſhment given by the mouth, when this can be done; and by glyſters of ſtrong broths, when the jaws are ſo firmly contracted as to prevent food from being received by the mouth: And we may, by removing a tooth or two, even in caſes of this kind, convey food to the ſtomach; ſo that wherever the ſymptoms of locked-jaw are obſerved to be approaching, one or two of the teeth ſhould be taken out, as they cannot be removed but with much more difficulty after the jaws are firmly clinched.

Having thus conſidered the various circumſtances relating to wounds in their moſt uſual form, with the means of cure adapted to each of them, we ſhall now proceed to mention more particularly ſome varieties in thoſe affections which point out a different mode of treatment, and theſe are punctures, laceration, and contuſion.

SECTION III.

Of Punctured Wounds.

A Wound is ſaid to be punctured when it is made with a ſmall pointed inſtrument; and when the external aperture, inſtead of being wide and extenſive in proportion to the depth, is ſmall and contracted. A wound made by a thruſt of a ſmall ſword is of this kind.

Wounds of this kind prove, in general, more hazardous than inciſed wounds of a much greater extent; from deep ſeated nerves and other parts of importance being more apt to be partially hurt; from extraneous bodies being carried to a depth from whence they cannot be eaſily removed;

ved; from the diſcharge which they afford being more apt to lodge; and from the ſides of the punctured parts being in many inſtances made to adhere with difficulty. Theſe are points of the utmoſt moment, not only from their being often productive of much diſtreſs to patients, but from the embarraſſment which they give to practitioners; who are more apt to fail in their treatment of this variety of wound than of any other which falls within their management.

It is obvious, that all the riſk which occurs in theſe wounds proceeds from their being ſo contracted, that free acceſs cannot be got to their full depth: And it is equally evident that this can be obviated only by laying them freely open. Indeed, this is the idea which, in the treatment of punctured wounds, we ſhould always keep in view, that of converting them as far as poſſible into inciſed wounds with wide extenſive openings. This, however, is a queſtion about which practitioners are not agreed: Some adviſe the openings of punctured wounds to be enlarged either with tents or with the ſcalpel; while others allege that this is ſeldom requiſite. And they have alſo differed with reſpect to the time at which any dilatation of this kind ſhould be made; for while ſome adviſe it to be delayed for a few days only, others do not attempt it till every other means have failed.

In the treatment of punctured wounds our views ought to be the ſame as in caſes of ſinus. Indeed, a wound of this kind is exactly a ſinus in a recent ſtate; and by conſidering it as ſuch, the means of cure that will moſt likely prove ſucceſsful are at once pointed out. In every ſinus, our intention is to procure a reunion of the parts which have been divided; but we know from experience that this cannot be effected till a certain degree of inflammation is induced upon them. For this purpoſe, the introduction of a cord or ſeton along the courſe of a ſinus has frequently proved ſucceſsful;

and ſome have, with the ſame views, employed irritating injections. When by theſe means the internal ſurface of the ſinus is ſufficiently inflamed, the cure is to be completed, by compreſſion applied in ſuch a manner as to keep the parts intended to be united, in cloſe contact, till a ſufficient degree of adheſion is produced. Now, in the application of this treatment to punctured wounds, it is obvious, that the previous ſteps which we have mentioned for exciting inflammation, would ſeldom if ever be neceſſary; for one certain effect of every wound is to induce inflammation over all the parts which have been injured: So that *à priori* we ſhould be led to conclude, that compreſſion alone would in all ſuch caſes prove ſucceſsful; for we know that it ſeldom fails in other caſes of ſinus where a due degree of inflammation is induced. But we are deterred, in punctured wounds, from the immediate uſe of this remedy; at leaſt where they penetrate to any conſiderable depth, from our uncertainty with reſpect to extraneous bodies having been carried in or not, and from the inflammation in wounds of this kind being apt to run too high. In ſuperficial wounds, indeed, where we are certain of being able to extract any extraneous matter, and where the inflammation is for the moſt part moderate, compreſſion may be employed immediately; and when properly applied, it will not often fail. But for the reaſons juſt mentioned, it can ſeldom be employed with ſafety in wounds of much importance.

The practice I have long adopted in wounds of this kind is this: When they run in ſuch a direction as to prevent a ſeton from being carried along their whole courſe, I lay them open immediately from one extremity to the other, or as far as it can be done with ſafety, either with a probe-pointed biſtoury, or with a ſcalpel and director: and this being done, the parts are dreſſed in the manner we have adviſed above, in caſes of ſimple inciſed wounds. But when it appears that a ſeton can with propriety be uſed, emollient poultices are firſt applied, and continued till a free ſuppuration is induced, and till there is no longer any cauſe to fear that the ſymptoms of inflammation are to proceed too far. A cord is then introduced nearly equal to the ſize of the opening; and being allowed to remain till there is reaſon to imagine that any extraneous matter lodged in the wound is diſcharged, it is then gradually leſſened, by taking away a thread or two every three or four days; and when reduced to a third or fourth part of its original thickneſs, it is taken out entirely; when the remainder of the cure is for the moſt part eaſily effected by the application of moderate preſſure along the courſe of the wound.

When a punctured wound is laid open at both ends, a cord may be eaſily introduced by means of a blunt probe, with an eye at the end of it. But when the inſtrument has not paſſed through the integuments on the oppoſite ſide to which it entered, a counter opening muſt be made, either by cutting with a ſcalpel on the round end of a blunt probe, or by paſſing a lancet-pointed needle, covered with a canula, along the ſinus, and puſhing it out at the oppoſite ſide with the ſeton attached to it.

In either of theſe ways the cure of ſuch wounds may often be accompliſhed. But wherever the practice is admiſſible, I am clearly of opinion, that laying them open immediately after the accident is preferable to the other: for by means of it all extraneous bodies are at once brought into view; hemorrhagies are eaſily reſtrained; and all that pain and trouble which ſometimes occur from a partial diviſion of nerves or tendons are directly obviated. Nor is the inflammation, which often ſucceeds to punctured wounds, apt to run ſo high as it uſually does when any other mode of treatment is adopted. So that much diſtreſs would be prevented, and much time ſaved, if this method of cure was more generally practiſed. To thoſe not much accuſtomed to this kind of buſineſs, the enlarging of a ſmall puncture, ſo as to form an extenſive wound, appears to be unneceſſary and cruel: but whoever has ſeen much of this branch of practice will know, that the greateſt diſtreſs often ariſes from the ſmalleſt punctures; that ſurgeons are often baffled and much diſappointed in their treatment of them; and he will ſoon find, that nothing ſo effectually obviates this as the practice we have mentioned, that of laying the punctures freely open as ſoon as poſſible after they are inflicted. Indeed, the ſooner it is done, the better. No advantage can accrue from delaying it; and a patient always ſubmits to it moſt readily at firſt, while at the ſame time it is productive of leſs pain than it muſt neceſſarily give when the parts are ſwelled and inflamed, which they commonly are in the courſe of a few days from the time of ſuch injuries being inflicted. In every wound therefore of this kind, particularly in thoſe which are often received in duels with ſmall ſwords, and in battles with the points of bayonets, the enlargement ſhould take place even before the parties are carried from the field; by which many inconveniences which naturally attend theſe injuries would be prevented.

There are ſome caſes, however, in which this practice cannot with propriety be followed; in punctures which run deep among the large muſcles; and eſpecially in ſuch as are contiguous to any of the large blood-veſſels and nerves. As more danger would accrue from wounding theſe than could probably be compenſated by any advantage gained by dilating the wounds, it is better in ſuch circumſtances to reſt ſatisfied with laying the parts open as far as it can be done with ſafety; to truſt to the ſuppuration which will enſue for bringing off any extraneous matter that may be lodged in the wound; and to a proper application of preſſure for completing the cure. Or the practice we have mentioned above, of introducing a ſeton, may be attempted; for a cord may be paſſed with ſafety where it might be very improper and even dangerous to make a deep inciſion.

But it is proper to obſerve, that there are ſome caſes in which even a ſeton cannot be introduced: for a puncture ſometimes runs in ſuch a direction, as not to admit of a counter opening. We muſt here truſt to a proper application of preſſure, not merely for preventing any lodgement of matter, but for effecting a cure by producing an adheſion of the divided parts; and when this fails, injections of a moderate degree of aſtringency may be uſed with advantage: but as remedies of this kind tend to counteract the very intention for which ſetons are employed, they ſhould never be adviſed till it appears that the latter will not ſucceed. Setons, as we have already obſerved, prove uſeful, by exciting a certain degree of inflammation along the courſe of a ſinus. Now, one uſual effect of aſtringent applications is, to diminiſh or even to remove inflammation. They ſhould never therefore be employed till all the ordinary means of cure have failed, when they may be uſed with a view to check the flow of matter when it is diſcharged in too great quantities, and in order to induce ſome degree of calloſity over the ſides of the ſores.

We think it right in this place to remark, that practitioners have differed much in their opinions with reſpect to the uſe of aſtringent injections in wounds: for while ſome are in the daily habit of employing them, others have ſaid that they are always pernicious, and ought never to be uſed. In the early ſtages of wounds they can never be neceſſary; and as they may do harm by waſhing away the matter too freely, they ſhould never be uſed as long as a cure is expected, either by the formation of new granulations, or by adheſion: but whenever we have reaſon to conclude that this cannot probably happen, we may with propriety recommend them. Various forms of them are mentioned by authors; but none of them are ſo harmleſs, and at the ſame time anſwer with ſuch certainty, as weak ſolutions of ſaccharum ſaturni. Lime-water is uſed with the ſame views; and water ſtrongly impregnated with alum, or mixed with an equal quantity of claret or port-wine, is often employed with ſucceſs.

In the treatment of punctured wounds where ſetons cannot be employed, it is ſometimes difficult to prevent the external aperture from cloſing long before any tendency to heal appears in the bottom of the ſore; and if it be not prevented, much miſchief is apt to enſue by matter collecting beneath, and burſting out from time to time. With a view to prevent this diſagreeable occurrence, tents are employed of prepared ſponge, gentian root, and other articles, which, by ſwelling with the moiſture of the ſores, ſerve very effectually to keep them open.

But while they anſwer this purpoſe, they are very apt to do miſchief. When the opening of a ſore is plugged up with a tent, the matter which forms can never be diſcharged but at the renewal of the dreſſings; by which means it will neceſſarily collect in ſuch quantities as to give riſe to abſorption, as well as to the formation of ſinuſes, by the matter ſpreading between the layers of the contiguous muſcles. Tents, therefore, which are of ſolid materials, ought never to be of ſuch a magnitude as to fill the openings of ſores. They will not readily do harm when they are of ſuch a diameter as to admit of a diſcharge of matter while they are inſerted. But when they are employed of ſuch ſizes as to fill the openings entirely, they ought always to be hollow; by which the apertures into the ſores will be prevented from contracting, while the matter will be diſcharged as quickly as it is formed. For this purpoſe practitioners ſhould be provided with tubes of different

ent forms and ſizes, ſo as to be able to ſuit any aperture they meet with. Silver tubes are commonly employed ; but thoſe of lead anſwer better. Being ſofter than the others, they do not create ſo much uneaſineſs, and they are more readily formed into any particular ſhape, ſo as to anſwer for ſinuſes of a ſtraight or crooked direction.

We muſt obſerve, however, that tents and tubes of every kind ſhould be uſed with caution; and it is more particularly neceſſary that this ſhould be held forth to beginners, for there is no point in practice in which they are more apt to err. As they are early made ſenſible of the danger which enſues from matter being allowed to collect in ſores, they very univerſally fly to the aſſiſtance of tents where-ever a puncture or a ſinus is diſcovered. But it is right they ſhould know that tents are ſeldom neceſſary : for when once a vent is given to matter, the opening will in general be preſerved merely by the continuance of the diſcharge. In a few inſtances, indeed, it is otherwiſe; and in all ſuch caſes the leaden tubes ſhould be preferred.

We come now to ſpeak of thoſe wounds which are attended with laceration and contuſion; and as both of theſe circumſtances require nearly the ſame method of treatment, it will not be neceſſary to ſpeak of them in ſeparate ſections.

SECTION IV.

Of Lacerated and Contuſed Wounds.

A Wound is ſaid to be lacerated, when the parts, inſtead of being divided with a ſharp-cutting inſtrument, are forcibly tore aſunder; and when, inſtead of a ſmooth equal ſurface, the edges are ragged and unequal: And we conclude, that contuſion takes place when a wound has been made with a blunt or obtuſe body.

Contuſed and lacerated wounds differ in many points from ſimple inciſed wounds; but in nothing more than in this, that while they are commonly more hazardous, they ſeldom at firſt exhibit ſuch alarming appearances. Thus a ſimple cut, which commonly heals with eaſe, is often attended with a much greater retraction of the divided parts, and with more profuſe hemorrhagy, than a contuſed or lacerated wound. Indeed it is one conſtant effect of contuſion and laceration to prevent the effuſion of blood, by which inattentive obſervers, in forming opinions of injuries of this kind, are very apt to be deceived: for as hemorrhagy is the moſt alarming ſymptom with which wounds are attended, when it does not occur to any great height, they are apt to conclude that nothing bad can happen. Practitioners of experience, however, will not be deceived by this: for it has long been known, that injuries of this kind prove always more dangerous than any other kind of wound; and the more violent the contuſion or laceration has been, the leſs blood is always poured out, inſomuch that there are inſtances even of limbs being tore off without any hemorrhagy enſuing.

The pain of lacerated and contuſed wounds generally varies according to the violence of the injury. Thus, in leſſer contuſions, the pain is often ſevere, while it is apt to be inconſiderable where the nerves of any part have been completely deſtroyed.

The immediate effect, both of laceration and contuſion, is ſwelling or tumefaction, which always takes place in a greater or leſſer degree in the retracted edges of the wound. This ſeems to be the conſequence of effuſion into the ſurrounding cellular ſubſtance. When the violence has not been ſevere, this effuſion commonly terminates in ſuppuration; the contuſed parts ſeparate from thoſe beneath in the form of ſloughs; and a cure of the remaining ſore is obtained by the means we pointed out when ſpeaking of ſimple inciſed wounds. But when the parts are ſo much injured as to have their texture much deſtroyed, and eſpecially when any of the larger arteries have been obliterated, there will always be cauſe to ſuſpect that mortification will occur. In ſound conſtitutions, and where the wound is not extenſive, even this will not often prove fatal: for in ſuch circumſtances the mortified parts commonly fall ſoon off, and a cure is afterwards effected in the uſual manner. But in wounds attended with contuſion or laceration to any conſiderable extent, if the habit of body be not perfectly good, the gangrene which enſues is always to be conſidered as hazardous: for the diſeaſe does not neceſſarily ſtop with the parts which have been injured; but is apt to proceed to thoſe which were not immediately hurt by the accident.

And again, even where mortification

does not ſucceed immediately, when parts have been either much lacerated or contuſed, ſuch a violent degree of inflammation is apt to occur as often terminates in mortification, notwithſtanding all our endeavours to prevent it; and in whatever way the diſeaſe be induced, it is always attended with much danger: for beſides the riſk of parts being deſtroyed by it, which are immediately neceſſary for life, the abſorption of putrid matter from a gangrenous ſurface, proves often ſuddenly fatal, even when the ſize of the ſore is ſo inconſiderable as to give no cauſe to ſuſpect danger.

It is therefore obvious in the treatment of contuſed and lacerated wounds, that our principal object is to guard againſt the acceſſion of gangrene. But it is likewiſe clear, that this is not always to be done by the ſame ſort of means: for we may readily ſuppoſe, that much advantage may be derived from blood-letting, and other evacuations, where the injured parts are highly inflamed, while no benefit would probably reſult from them in any other ſituation. This, however, is a point of importance, and merits particular attention.

In lacerated or contuſed wounds, where the parts are much injured, it is the common practice to give large quantities of bark almoſt immediately, and to apply warm dreſſings and other antiſeptics with a view to prevent gangrene. It is evident, however, that the indiſcriminate adoption of this practice muſt frequently do miſchief: for however beneficial it may be in particular caſes, where gangrene has already taken place, it is certain that it will rather do harm where ſymptoms of inflammation ſtill continue violent; and unleſs mortification actually exiſts, it is not clear that in any inſtance it will prove ſerviceable; for although we have various proofs of the efficacy of bark in putting a ſtop to the progreſs of gangrene, I have never in any caſe been ſenſible of any advantage being derived from it when uſed as a preventative of it.

Gangrene may ariſe in theſe wounds from two cauſes: From the ſtoppage of the circulation by the total deſtruction of the large blood-veſſels of a part; and from violent inflammation.

Gangrene proceeding from inflammation, is moſt to be dreaded here; for that which ariſes from the deſtruction of blood-veſſels is by no means ſo frequent. The inflammation therefore which takes place in wounds of this kind, will always demand our attention in the firſt place.

As the hemorrhagy, ſubſequent to contuſion or laceration, is ſeldom alarming, and as blood diſcharged from any of the veſſels that have been injured tends more effectually than any other remedy to prevent inflammation; ſuch quantities ſhould be taken away in this manner as the nature of the injury may indicate, and as the ſtrength of the patient may admit. After this, if the divided arteries continue to throw out blood, they muſt be ſecured by ligature: for till the diſcharge of blood be ſtopped, the patient will not conſider himſelf as ſafe; nor can the wound be examined with accuracy. The parts are now to be cleared of all extraneous bodies, as far as this can be done with propriety, and are to be placed as much as poſſible in their natural ſituation; but no kind of future ſhould be employed for their retention. If the violence which has been done to them has been conſiderable, and eſpecially if the patient complains of much pain, it will be ſtill neceſſary to take away blood in proportion to the ſtrength of the patient: and as local blood-letting proves in ſuch caſes always highly ſerviceable, the beſt method of diſcharging it is by means of leeches, applied as near as poſſible to the edges of the ſore. Indeed no remedy I have ever employed proves ſo certainly uſeful as the diſcharge of blood in this manner; for it not only tends to prevent the inflammatory ſymptoms from running high, but it very commonly renders the pain moderate, even when it has previouſly been ſevere. It ought never therefore to be omitted; but the practitioner ſhould take care that it be proportioned as nearly as poſſible to the violence or urgency of the ſymptoms: for the diſcharge of a ſmall quantity of blood will in ſome caſes of contuſion or laceration prove fully ſufficient; while in others, it is neceſſary to repeat the operation once and again.

As ſoon as a ſufficient quantity of blood is diſcharged, the parts affected, after being dreſſed with pledgits of any emollient ointment, ſhould be completely covered with a warm emollient poultice; and this, together with warm fomentations, ſhould be renewed three or four times a day, ſo as to promote, with as much certainty as poſſible, the formation of pus. To induce ſuppuration in wounds of this kind, is indeed an object of the firſt importance:

it generally relieves all the ſymptoms; and till ſuch time as it takes place, we have often reaſon to dread the event.

We commonly find, when ſores of this deſcription become covered with good pus, that the pain and tenſion abate; and ſuch of the parts as have been much lacerated and contuſed, and which hitherto have been ſloughy or perhaps black with mortification, begin now to ſeparate from thoſe beneath: and this being accompliſhed, they may in general be cured in the ſame manner with wounds of any other kind. Nay, when brought to this healing ſtate, we may even attempt with ſafety to expedite the cure by drawing the edges of the retracted ſkin into contact, either by means of the uniting bandage or with adheſive plaſters; for although this would be improper in the commencement of ſuch wounds, while there is any riſk of the tenſion and inflammation proceeding too far, it may with much propriety be adviſed when there is no longer any reaſon to be afraid of theſe ſymptoms.

When practitioners are immediately called, ſo as to employ the means we have mentioned in due time, they will not often fail in ordinary caſes: but it frequently happens, whether from the violence of the injury, the tendency in ſome conſtitutions not only to inflammation but to gangrene, or from the proper remedies not being timeouſly applied, that all the ſymptoms become daily worſe, and, notwithſtanding repeated bloodlettings both general and local, all thoſe parts which were at firſt inflamed become perfectly black and mortified. We are not now to truſt to evacuations: on the contrary, whatever tends to debilitate ſhould be avoided; and we know from experience, that, in this ſituation, no remedies prove ſo uſeful as thoſe which invigorate and reſtore the tone of the conſtitution.

With this view, the patient ſhould be deſired to live upon nouriſhing food.

He ſhould be allowed as large a quantity as he can take, of good wine, or of ſtrong malt-liquor, or of both; and Peruvian bark ſhould be given in as large doſes, and theſe ſhould be as frequently repeated, as his ſtomach will permit. Indeed bark is perhaps the only remedy on which we can place any dependence; and as we know from experience that it may with ſafety be given in great quantities, it ſhould always be exhibited in caſes of this kind without farther limitation than what neceſſarily ariſes from the ſtate of the ſtomach. We may remark, too, that it proves in general uſeful nearly in proportion to the quantity which is taken; and it often happens, that large doſes are not more nauſeated than thoſe which do not contain above half the quantity. Where it is of importance to throw in a large quantity of the remedy in a ſhort ſpace of time, as is always the caſe in gangrene, it ſhould never be given in leſs than doſes of a dram, or even of two drams when the patient can bear it;

and theſe ſhould be repeated every hour. Bark, in ſome caſes, ſeems to prove more powerful when conjoined with the vitriolic acid: elixir of vitriol may therefore be given along with it. In gangrene ariſing from debility, opium frequently proves uſeful; and as it does not counteract the bark, the two remedies may with ſafety be preſcribed together.

In the mean time, the ſtate of the ſore muſt be particularly attended to. As long as there is any tendency in the contiguous parts to inflammation, the beſt applications, perhaps, are warm emollient poultices and fomentations; for, as we have elſewhere ſhown, that the ſeparation of mortified parts is commonly effected by a ſuppuration taking place between them and the adjoining ſound parts, we neceſſarily derive moſt advantage from whatever tends to promote it*. But as no ſuppuration will occur without ſome degree of inflammation, when there is no reaſon to imagine that this will otherwiſe happen, we ſhould endeavour to excite it by the application of warm dreſſings to the ſore, and eſpecially by the uſe of ſtimulating ſubſtances to the contiguous ſound parts. Muſtard applied in the form of a poultice, as well as ſome others of the rubefacients, have proved uſeful in this manner; and I have employed with advantage a ſtrong ſolution of crude ſal ammoniac in vinegar and water. It is proper, however, to obſerve, that this practice muſt be managed with caution: for much inflammation might often prove detrimental, while in every inſtance it would be unneceſſary; for we know from experience, that a ſmall degree of it proves always ſufficient. As ſoon, therefore, as it is obſerved that the mortified parts are ſurrounded with a kind of inflamed ring, the ſtimulating applications ſhould be removed in order to give place to warm emollients for the purpoſes mentioned above. Any parts that are completely mortified may with ſafety be removed; indeed the offenſive ſmell which they produce renders this a neceſſary meaſure: but the common practice, of making inciſions through the diſeaſed parts into thoſe beneath which are ſtill ſound, ſhould never be adopted. No advantage can be derived from it, and it may be productive of much harm. It is recommended with the view of giving more free acceſs to the ointments, and other remedies uſed as dreſſings, than could otherwiſe be obtained; but I have not in any inſtance ſeen it prove uſeful, and in different caſes I have been ſenſible of its doing miſchief. It may very readily carry the putrid matter of gangrene more deeply into the contiguous ſound parts than it would otherwiſe penetrate. In ſome caſes it has evidently induced more inflammation than was neceſſary; and in more inſtances than one I have known ſcarifications prove hurtful, by exciting very troubleſome hemorrhagies.

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* Vide Treatiſe on Ulcers, &c. Part I. where this ſubject is more fully conſidered.

By perſiſting in the uſe of bark, and of the other remedies we have juſt mentioned, and eſpecially if the ſtrength of the patient be ſupported with wine and nouriſhing food, even bad caſes of gangrene will often terminate happily; the mortified parts will ſeparate, and the remaining ſore will heal kindly and eaſily with common mild dreſſings: But in other inſtances, notwithſtanding all our endeavours, the diſeaſe will continue to ſpread, and nothing will prevent its fatal termination. When gangrene is ſeated in any of the extremities, it is the common practice, when other means of cure fail, and when the mortification is ſtill advancing, to amputate above the diſeaſed parts: we have elſewhere ſhown, however, that this practice ſhould not be adopted; and when treating of amputation, we ſhall again have occaſion to enter on the conſideration of it.

In the treatment of mortification, it is a good general rule to be very ſparing of every evacuation from the firſt appearance of the diſeaſe, and this eſpecially with reſpect to blood-letting. But in addition to what I have already obſerved, I think it right to remark, that in all caſes of inflammation where the approach of gangrene is dreaded, and particularly in wounds attended with much contuſion or laceration, till mortification actually occurs, we ſhould proceed with freedom in an antiphlogiſtic courſe, particularly in diſcharging as much blood as the degree of inflammation may appear to render neceſſary; and I inſiſt on this point the more fully, from having often obſerved much miſchief enſue from practitioners being too timid in adviſing it. Being afraid of ſinking the patient too much, they avoid the only remedy that could probably ſave him: for, in ſuch circumſtances, it is the violence of the inflammation of which we have moſt reaſon to be afraid; and as we know of no remedy which can with ſuch certainty be depended upon for removing inflammation as blood-letting, it ſhould be preſcribed with as much freedom as the ſtrength of the patient and other circumſtances will permit; by which the acceſſion of gangrene will often be prevented when all the uſual remedies would probably fail.

What we have hitherto ſaid in this and the preceding ſections, may be conſidered as common to wounds in general: We now proceed to conſider thoſe wounds, which, either from the nature of the part wounded, or from its ſituation, demand a peculiar treatment.

SECTION V.

Of Wounds in the Veins.

IT is difficult to reſtrain the hemorrhagies which ſometimes enſue from wounded arteries, on account of the force with which the blood is propelled into them by the heart, and on account of their muſcular coats, which prevent them from collapſing readily. But in the veins neither of theſe circumſtances take place; the contractile power with which they are endowed is very inconſiderable; and we do not perceive that the circulation in them is much affected by the action of the heart.

For theſe reaſons, wounds in the veins heal with more eaſe and are attended with leſs danger than wounds of the arteries: Indeed we know, that the largeſt veins are often much injured, and that no bad ſymptom will enſue; while very troubleſome conſequences will follow from wounds even of ſmall arteries. In general, therefore, we have no great reaſon to be afraid of wounds in the veins: for while we have it in our power to check the hemorrhagy, we never obſerve any detriment to enſue even from the obliteration of the largeſt external veins; for the anaſtomoſing branches ſo readily admit of dilatation, that they ſoon become ſufficient for carrying on the circulation beyond the parts affected.

We commonly find, that a longitudinal cut in a vein heals with eaſe when it is ſlightly covered with a piece of dry lint or ſoft old linen: When this fails, the hemorrhagy may be always ſtopped by the application of a piece of dry ſponge or of agaric to the bleeding orifice, and ſecuring it with moderate preſſure. But in tranſverſe cuts in the large veins, or when any of them are cut entirely acroſs, it may ſometimes happen, either that preſſure cannot be properly applied to the wound, or that it does not prove ſufficient for ſtopping the diſcharge: In ſuch caſes, eſcharotic applications are commonly adviſed, and by ſome practitioners the actual cautery is employed; but none of theſe can be depended on; and they are apt to create a good deal of uneaſineſs. The ſame remedy therefore ſhould be employed here that we daily uſe in hemorrhagy from wounds in the arteries, namely, ligatures; which, when properly applied, neither fail in their effects, nor produce any material inconveniency. In the application of ligatures, we have elſewhere ſhown, that the crooked needle ſhould ſeldom or never be uſed, and that the tenaculum alone ſhould be employed.

SECTION VI.

Of Wounds in the Lymphatics.

THE lymphatics are equally liable to injuries with other parts of the body: As they often lie contiguous to veins, they are ſometimes wounded in the operation of blood-letting; and they are not unfrequently cut in opening buboes and other glandular collections of matter.

When the ſmaller branches only of lymphatics are opened, we may readily ſuppoſe that they will heal along with the reſt of the wound; but the wounded lymphatic is ſometimes ſo large, that it does not heal ſo ſoon as the other parts, but continues to pour out its contents in conſiderable quantity, giving a good deal of inconveniency, and at the ſame time weakening the patient: We ſhould never heſitate therefore in putting a ſtop to the diſcharge.

Various means have been propoſed for effecting this. In ſome caſes it has been done by compreſſion alone: Aſtringents have been adviſed, together with the application of dry ſponge, agaric, and of common puff-ball; and both the actual and potential cauteries have been uſed. But when moderate preſſure fails, the moſt effectual remedy is the taking up the injured lymphatic with a ligature, in the ſame manner as we do wounded arteries. No objection can be made to this; and it anſwers the purpoſe in the moſt certain manner.

SECTION VII.

Of Wounds in the Nerves and Tendons, and of Ruptures of the Tendons.

WHEN treating of blood-letting, as well as in a preceding part of this chapter, I had occaſion to ſpeak of the conſequences which ſometimes enſue from partial diviſions of nerves and tendons, and of the means which ſeem to be beſt adapted for removing them. At preſent it might be ſufficient to refer to theſe parts of the Work; but I ſhall now make a few additional obſervations.

It muſt often happen, that nerves and tendons are partially divided along with other parts; but when no pain ariſes from it, this accident does not particularly come under the obſervation of practitioners. In ſuch caſes they heal along with the other parts of the wound: But in various inſtances, either from ſome ſingular degree of irritability in the injured parts, or from a peculiarity of conſtitution, which we cannot explain, the ſlighteſt puncture of a nerve or of a tendon, will induce very ſevere pain, inflammation, convulſions, and even death.

Whenever we have reaſon to ſuſpect, from the violence of the pain, that the other ſymptoms may ſupervene, the moſt effectual means ſhould be immediately uſed for preventing them: for when once convulſions take place, we are never certain of being able to allay them. In ſome caſes, large doſes of opiates anſwer the purpoſe: but when they do not very quickly prove ſucceſsful, no time ſhould be loſt in putting the only remedy in practice, on which we can place much dependence; and that is, the complete diviſion of the injured nerve or tendon. By this we may indeed induce a certain degree of inſenſibility in the parts beneath, or they may even be deprived of the power of voluntary motion; but any inconvenience which this may occaſion will be trifling, when compared with the advantages which reſult from the operation: For I can from experience aſſert, that it ſeldom fails in removing all the ſymptoms, when it is timeouſly employed; while, in different inſtances, wounds of this kind have terminated in death where it has been omitted.

In this manner we may obviate the effects of punctures and partial wounds, either in the nerves or tendons: But it is neceſſary to mention the method of treatment to be purſued in the healing of wounds or ruptures of the large tendons, when they are completely divided. As a complete diviſion of any of the large tendons is always attended with much retraction, it was long ago inculcated by practitioners, to draw the retracted extremities of the ruptured tendon into contact, and to retain them in this ſituation by ſutures:

and this being done, and the limb placed in a favourable ſituation, the reſt of the ſore was treated in the uſual way.

There is no reaſon to doubt of cures having been often accompliſhed in this manner: nay, where tendons have been merely ruptured, without any external wound, as often happens with the tendo Achillis, the retracted ends of the tendon have been laid bare by an inciſion, for the very purpoſe of retaining them by ſutures. This, however, is a very painful operation; and as the ſame intention may be accompliſhed in a much more ſimple manner, it ought to be laid aſide. When it was firſt propoſed to unite ruptured or wounded tendons by means of ſutures, it was the common opinion, that, in order to inſure a reunion of divided parts, it was abſolutely neceſſary to bring them into cloſe contact; and the ſame idea prevailed, not merely with reſpect to tendons, but with regard to bones, as well as other parts.

In the treatment of fractured bones

and of ruptured tendons, it is no doubt a right general rule to endeavour to bring the divided parts as nearly into contact as poſſible: but we now know that cures may be accompliſhed where the retraction of parts is ſo conſiderable as to render it impoſſible to draw them together; nay, that it has often been done, even where a portion of a tendon or of a bone has been completely removed. Very conſiderable portions of bone have been regenerated; and although we are not certain that any part of a tendon has ever been renewed, yet ſuch adheſions always take place between the retracted ends of the divided tendon and the contiguous parts, as tend in a great meaſure to ſupply the deficiency. Thus I have known different inſtances of the tendon of the rotula being ruptured, as well as of the tendo Achillis: and although the ends of the retracted tendons could never be brought within an inch of each other; yet in all of them, where proper attention was given, the cures have been ſo far complete, that the uſe of the limbs has been very perfectly reſtored. Some degree of ſtiffneſs has often indeed remained for a conſiderable time; but at laſt even this ſymptom has very commonly been removed.

Wherever a wounded tendon may be ſituated, or even where it is only ruptured, without any injury being done to the external parts, the limb ſhould be placed in ſuch a manner as will moſt readily admit of the retracted ends of the tendon being brought nearly together; and when in this ſituation, the muſcles of the whole limb in which the injury has happened muſt be tied down with a roller in ſuch a way as will prevent them from all kind of exertion during the cure, at the ſame time that the parts are placed in ſuch a poſition as will tend moſt effectually to keep them eaſy and relaxed. Thus, in a wound or rupture of the tendon of the rectus muſcle of the thigh, the patient's leg ſhould be kept as much as poſſible ſtretched out during the cure, while the thigh ſhould be in ſome degree bent, ſo as to relax the muſcle itſelf as far as it can be done. While in ſimilar affections of the tendo Achillis, the knee ſhould be kept conſtantly bent; ſo as to relax the muſcles of the leg as much as poſſible; at the ſame time that the foot ſhould be ſtretched out, ſo as to admit of the ends of the ruptured tendon being brought nearly into contact. In applying a roller to ſecure the muſcles and tendons in this ſituation, it ſhould be done with a firmneſs quite ſufficient for the purpoſe, at the ſame time that care is taken to prevent it from impeding the circulation: with this view, fine ſoft flannel ſhould be preferred either to linen or cotton; for being more elaſtic, it more readily yields to any ſwelling with which the limb may be attacked.

The late Dr Monro was the firſt who gave any accurate directions for treating a rupture of the large tendons; and he has probably done it with the more preciſion, from having himſelf experienced the effects of this misfortune in the tendo Achil-

PLATE LXVIII.

FIG. 1.

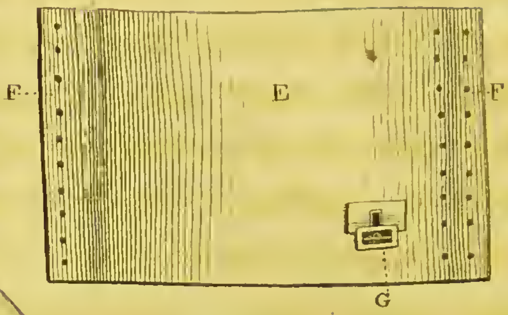
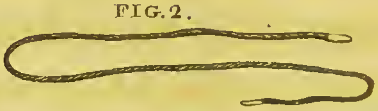


FIG. 2.



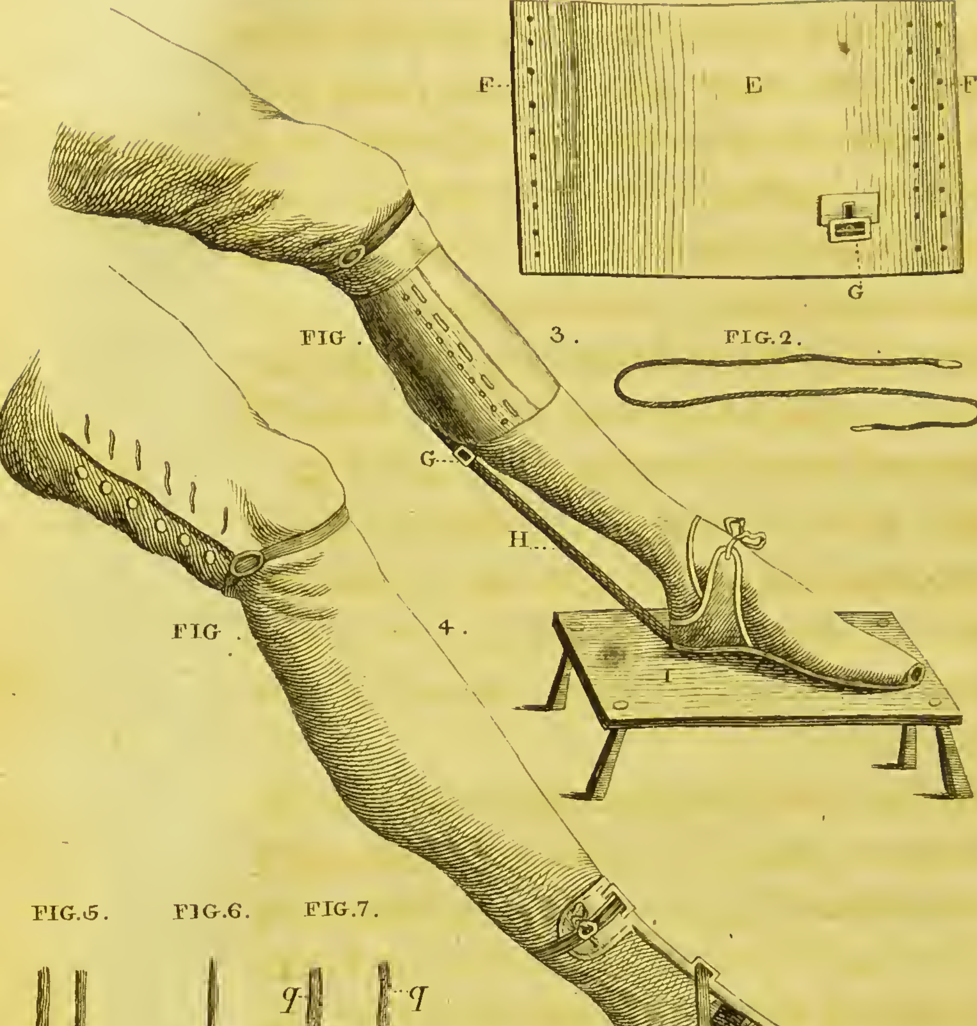


FIG. 3.

FIG. 4.

FIG. 5.

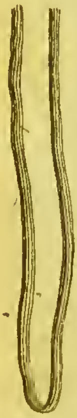


FIG. 6.

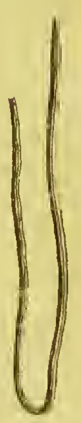


FIG. 7.

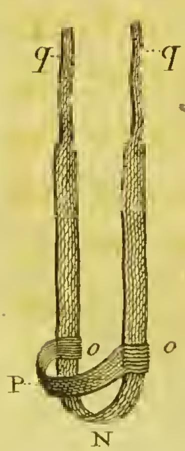


FIG. 8.

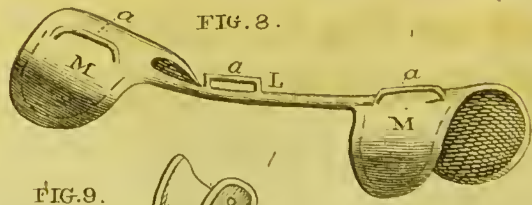
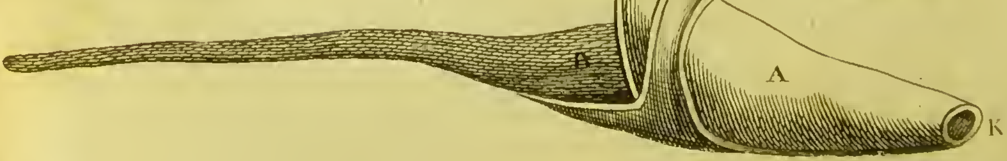


FIG. 9.



Achillis. As the method which he points out, and the inſtruments which he recommends, are very ſimple and judicious, and as they have in various inſtances been found to anſwer very completely, a deſcription of them will be conſidered as a proper addition to this article.

The different inſtruments uſed by Dr Monro, with the ſeveral parts of each of them, are repreſented in Plate LXVII.

Fig. 9. Is a foot-ſock or ſlipper, A, of double quilted ticken; from the heel of which, B, the quilted ſtrap, D, is of ſuch a length as to reach above the calf of the leg.

Fig. 1. A ſtrong quilted calf-piece, E, with pye-holes, FF, on each ſide, through which a lace, fig. 2. is to be paſſed, and with a buckle, G, ſo placed on its backpart, that when the lacing is on the outſide of the leg, the buckle will be in the middle of the lower part. Two rows of pye-holes are here repreſented, one on each ſide; either of which may be uſed according to the ſize of the leg.

In Dr Monro's caſe, the foot and leg were firſt wrapped in ſoft flannel ſmoked with fumes of benzoin, when he put on, as in fig. 3. the foot-ſock A and calf-piece E; and bringing the ſtrap H thro' the buckle G, he could by it extend the foot, and pull down the calf to what degree might be judged proper, and there it was ſecured with the buckle.

This bandage anſwered the intention perfectly well; and it was wore night and day. It ſhould be drawn tighter during ſleep, and relaxed when the patient is awake and on his guard: during which the foot ſhould be placed upon a ſtool, as at I; and the calf-piece ſhould be frequently ſtuffed, or made eaſier by looſening the lace, ſo as to prevent the foot from ſwelling, which is apt to happen if this be omitted. To prevent the toes from becoming uneaſy, the foot-ſock ſhould be left open at the end K.

During the firſt fortnight the Doctor made no motion nor effort with his foot, but was carried in a chair, running on caſtors, from one part of his houſe to another: After this he began to move the foot backwards and forwards, ſo gently as not to give pain. In a gradual manner theſe motions were increaſed; the extenſion of the leg and flexion of the foot were always ſtopped on their producing any uneaſineſs.

On beginning to walk, the affected leg, which was the left, was always put before the right, ſo that the left foot might be as well extended as poſſible. To prevent any danger from falling, a cane was uſed in the right hand.

The void between the two ends of the divided tendon became inſenſible in a few days, except that a ſoftneſs was felt there more than any where elſe; but this part turned gradually thicker and harder, till a knot was formed in it of the ſize of a middle-ſized plum. At firſt this tumor was equally hard with a piece of cartilage; but it gradually became ſofter, and diminiſhed ſo much, that at laſt it was ſcarcely perceptible.

With a view to ſtrengthen the leg and foot, cold water was poured upon them, and immediately thereafter they were well rubbed. This was firſt employed ſome weeks after the accident: but no advantage being derived from it, the parts were afterwards ſtrongly rubbed twice a day with unguentum altheæ, or ſome other emollient; and this was continued till the limb could be uſed with freedom.

In about two weeks from the time of receiving the injury, the Doctor was obliged to go abroad, when he uſed a pair of ſhoes with heels two inches high, and applied the machine, which we ſhall preſently deſcribe, through the day, inſtead of the former bandage; which, however, was always put on at night for a month longer.

This new machine, fig. 8. is a piece of ſteel, the middle ſtalk of which, L, is narrow but ſtrong; the ends, MM, are thin and concave, and muſt be adapted to the convexity of the foot and fore-part of the leg. Three ſtaples, *a, a, a,* ſtand up from the fore-part of the ſteel; one in the middle of each of the broad ends, and the third in the middle of the ſtalk. All the ſteel, except the ſtalk, ſhould be covered with ſoft leather; and the concavities of MM ſhould be well buffed, as the ſofter rupture-bandages commonly are.

After putting on the ſhoes and ſtockings, one end of this machine was put upon the broad-part of the foot, nearer the toes than the buckle of the ſhoe, and the other end was placed upon the fore-part of the leg; then one ribband, or a thong of leather, fig. 5. was put round the foot, and another, fig. 6. round the leg, to paſs through the two ſtaples near the ends of the machine, and there ſecured with ſtraps or buckles, but without being drawn tight. A third ſtrap or ribband, fig. 7. with its middle, N, applied to the hollow of the foot, immediately before the heel, had its ends paſſed on each ſide of the foot through a noose, *o o*, of a fourth thong of leather, P, that came round the quarter-heel of the ſhoe, to be afterwards put through the middle ſtaple; where, after theſe ends, *q q*, were drawn as tight as was thought convenient for extending the foot, they were ſecured with the buckle or with knots. See the application of this machine in figure 4.

This was continued for the ſpace of five months; but thoſe who may find it inconvenient, might uſe inſtead of it a thong of leather, ſewed at one end to the upper and middle part of the quarter-heel of the ſhoe, and faſtened at the other end to a garter or ſtrap put above the calf of the leg. The high-heeled ſhoes were continued for a conſiderable time: two years elapſed before they were thrown aſide; by which means, and by treating the injured limb during all that period with great caution, a very complete cure was obtained; while others, who have not been ſo attentive to the management of matters of this kind, have not been ſo fortunate; ſome of them having the tendon ruptured a ſecond, or even a third time, and others remaining ſtiff and lame for a great length of time.

SECTION VIII.

Of Wounds in the Ligaments.

BY Ligaments, we underſtand thoſe flexible bodies which ſerve to cover the different articulations, and by which many of the bones are firmly tied to one another. The bones of the pelvis are united by ſtrong ligaments; and we know, that ſeveral other bones are chiefly connected by the ſame means. But as all theſe ligaments lie deep, they are not much expoſed to the effects of external violence; and the ſame cauſe puts it out of our power to apply any particular treatment for injuries which may accidentally be done to them. Our obſervations at preſent are therefore chiefly applicable to wounds of the ligaments of joints, commonly termed Capſular Ligaments.

As the ligaments are not ſo plentifully ſupplied with nerves as ſome other parts of the body, ſeveral anatomiſts have been induced to believe that they are not poſſeſſed of ſenſibility; by which we might be led to conclude, that injuries done to them, would not probably require much attention: But although Nature for obvious reaſons has not made the ligaments highly ſenſible; and altho' in a healthy ſtate they will bear much fatigue without ſuffering ſo much as other parts of the body; yet the fact is undoubted, that they are rendered extremely ſenſible by diſeaſe; and that wounds inflicted on them are frequently productive of very alarming conſequences. We have often indeed known the ligaments of joints much injured, nay,

violently

violently lacerated, by the heads of the bones which they ſurround being puſhed through them, as well as by other cauſes, without any bad effect being experienced from it; and in ſome caſes the wounds have healed as eaſily as if the ligaments had not been affected. Theſe, however, are rare occurrences, and are by no means to be depended upon: for in a great proportion of caſes where joints are wounded, the ſymptoms which enſue are ſevere and hazardous. Affections of this kind, however, are very deceiving: for in general nothing alarming appears at firſt, nor for ſeveral days after the accident; and when the patient is treated with care and attention, I have known a week paſs over before any other ſymptom has been obſerved than what uſually takes place in the moſt ſimple wounds. But, at length, the patient begins to feel an uneaſy ſenſation of ſtiffneſs over the affected joint, which by degrees turns more ſevere; when the parts become ſwelled, tenſe, and ſomewhat inflamed. In this ſituation the pain is in general ſo very ſevere, that the patient cannot allow the joint to be touched: He complains of a tightneſs round the whole, as if it was firmly tied or girded; and the inflammation, which at firſt was confined to the joint itſelf, is now apt to ſpread over the whole limb.

If the wound or laceration in the capſular ligament is large, the ſynovia is often diſcharged in conſiderable quantities at firſt; but the ſwelling induced by the inflammation gradually puts a ſtop to it, till at laſt the wound becomes dry and ſloughy. In the courſe of a few days, however, extenſive ſuppurations begin to form over the joint; and on theſe being laid open, large quantities of pus are diſcharged together with ſynovia. By this the tenſion and girding pain are immediately removed, and the patient experiences much relief; but ſucceſſive ſuppurations often take place, which from time to time excite a renewal of all the ſymptoms, and by which the patient's health is at laſt very apt to be much injured.

When wounds in the ligaments do not heal quickly, and almoſt without the formation of matter, this is in general the manner in which they terminate; at leaſt it is the caſe in the larger joints, and it is in theſe chiefly that they ever prove alarming.

From this hiſtory of the riſe and progreſs of the ſymptoms, ſome advantage may be derived in conducting the cure. From this it is evident, that it is not merely the injury done to the ligament which we have to dread; but a ſecondary train of ſymptoms, which are very apt to reſult from it. Although none of the lining membranes of cavities, which are naturally ſhut up from the air, ſeem to be endowed with much ſenſibility, it ſeems to be a very common effect of air finding acceſs to them to give them an exquiſite degree of it. Of this we have frequent proofs in wounds which penetrate the cavities of the thorax and abdomen; and it is evidently to this cauſe that we are to attribute thoſe conſequences which reſult from wounds in the capſular ligaments of joints.

This points out a very important circumſtance in the treatment of ſuch wounds; namely, the prevention, as far as is in our power, of air finding acceſs to theſe cavities. In large lacerated wounds this will, for the moſt part, be impracticable; but in common inciſed wounds, it may often be very completely effected.

It ought never to be attempted, till we are certain that any extraneous body that may have been carried in is extracted. This being accompliſhed, we may very commonly cover the wound in the capſular ligament entirely, by pulling the ſkin ſo far over it, that the wound in the one may not correſpond with that in the other; and as the ſkin about the joints is ſufficiently lax to admit of this, it may always be eaſily done. We are now to fix the ſkin in ſuch a manner that it may not retract, either by ſutures or adheſive plaſters: but in general the latter will prove ſufficient, if they be aſſiſted by the application of a proper bandage; and they are preferable to ſutures, which in this ſituation are apt to excite inflammation. After the plaſters are applied, the ſkin and cellular ſubſtance ſhould be ſupported in their ſituation by paſſing a flannel roller ſpirally round the joint, ſo as to produce an equal degree of compreſſion over the whole of it, of a tightneſs ſufficient for ſupporting the parts to which it is applied without interrupting the circulation. The patient ſhould be in bed while the dreſſings are applied, ſo that they may not afterwards be liable to be moved; and the limb ſhould be put upon a pillow, and placed in ſuch a ſituation as admits of the ſkin and other teguments being moſt completely relaxed, which will be found to be different in different parts even of the ſame joint. Thus, in treating a wound of this kind in the anterior part of the knee, the leg ſhould be kept extended during the whole progreſs of the cure; for in this ſituation the ſkin which covers the fore-part of the joint is moſt effectually relaxed; while, for a ſimilar reaſon, in penetrating wounds entering from the ham, the leg ſhould be kept bent.

In the mean time, in order to prevent the acceſſion of inflammation, the patient ſhould be put upon a low diet; his bowels ſhould be kept lax; a moderate perſpiration ſhould be excited; and he ſhould loſe a quantity of blood ſuited to his age and ſtrength.

By treating wounds of the joints with this ſtrict attention, I have known many of them terminate eaſily, which might otherwiſe have been productive of much diſtreſs: But when theſe means do not prove effectual, or when they have been too long neglected, ſo as that the application of them is no longer admiſſible, and which will always be the caſe when inflammation has taken place, other remedies muſt of courſe be employed.

In this ſituation, our principal object is to remove the inflammation; and if it be not ſpeedily accompliſhed, it will in all probability ſpread over the whole joint, when it very commonly terminates in extenſive ſuppurations. Every practitioner will know, that ſuch an occurrence is neceſſarily attended with much hazard; ſo that nothing ſhould be omitted by which it can probably be prevented. The moſt effectual remedy which I have ever employed, is local blood-letting; but, in order to prove uſeful, it muſt be carried to a conſiderable length. In ſtrong robuſt patients, eighteen or twenty leeches ſhould be applied as near to the part affected as they will bite; to be repeated daily as long as the continuance of the inflammation may render it neceſſary. Any of the ſimple ointments may be applied to the wound itſelf; but one of the beſt applications to the joint is the ſteams of warm vinegar, which have often appeared to prove uſeful in preventing the formation of matter. And as the pain in wounds of the joints is in general ſevere, large doſes of opiates muſt be given to allay it. In a few caſes I have known the pain much relieved by the external application of a ſtrong decoction of white popy-heads by way of fomentation: but for the moſt part, nothing proves effectual but the internal uſe of opium.

By due attention to theſe means they will commonly prove effectual, if they have not been either too long neglected or too ſparingly adminiſtered. From either of theſe cauſes, however; from the violence of the injury; or from ſome conſtitutional affection; the inflammation will, in ſome caſes, ſtill proceed to increaſe; and, notwithſtanding all our endeavours, will at laſt terminate in very large collections of matter, which will be partly within the capſular ligament of the joint, partly in the ſubſtance of the ligament itſelf, and in part it will be found to have ſpread through the cellular ſubſtance of the contiguous parts. In ſuch circumſtances, all that art can do is to give free vent to any matter that may form; which can only be done by making an opening in the moſt depending part of the collections as ſoon as the exiſtence of pus is aſcertained. In this manner, and by proper uſe of emollient poultices and fomentations whenever a new collection appears to be forming, we will ſometimes be able to ſave limbs, which otherwiſe it would be neceſſary to amputate: But whoever has had experience in this branch of practice will know, that when wounds in any of the larger joints terminate in ſuppuration within the capſular ligaments, that the riſk attending them is great; and that we can never, even under the beſt management, have any dependence on their terminating favourably. The principal reaſon, as we have already obſerved, of their continuing obſtinate, is the inflammation becoming violent; which, when not obviated by the means we have adviſed, is apt to produce ſuch large collections of matter; and one abſceſs is ſo apt to ſucceed to another, that the patient is at laſt exhauſted, when we are often under the neceſſity of removing the limb in order to ſave his life. In ſuch circumſtances, indeed, there is no room to heſitate; for when the ſtrength is much impaired by the frequent formation of abſceſſes, if the ſame diſpoſition continues, and eſpecially if any degree of hectic fever has taken place, the riſk attending any attempt to ſave the limb will now be conſiderable, while the chance of ſucceeding will be ſo ſmall, that it ſhould never be adviſed.

But although I am decidedly of opinion, in circumſtances, ſuch as we are conſidering, that it is the ſafeſt courſe to amputate the limb; yet I by no means agree with thoſe, who ſay, that almoſt every caſe of a wounded joint requires the ſame remedy. By many it has been aſſerted, that wounds in any of the larger joints almoſt univerſally terminate ſo unfavourably, that, in order to ſave much pain and trouble, as well as riſk to the patient, it would be the moſt adviſeable practice to amputate immediately after the accident, before there could be any chance of inflammation taking place. I am convinced, however, that this opinion is founded in error; and my reaſons for it are theſe:

Although it will not often happen that complete cures are obtained where the capſular ligaments of any of the larger joints are extenſively wounded, yet in ſome caſes it is otherwiſe. Of this I have met with different inſtances: And altho' ſuch injuries will not often be ſo effectually cured as to prevent a conſiderable degree of ſtiffneſs and immobility in the joints in which they are ſeated; yet even a complete anchyloſis is an inconvenience to which a patient ſhould ſubmit, rather than to the pain and hazard which uniformly attend the amputation of any of the extremities.

As it muſt be admitted, however, that the proportion of limbs which are ſaved by this practice, is extremely ſmall when the injury done to the capſular ligaments of joints are extenſive, this argument would not deſerve our attention, if the delay which it occaſions were to be attended with any additional hazard, or if it ſhould preclude amputation, if at any future period of the ſore it might be judged adviſeable. This indeed has been alleged by practitioners: but there is much cauſe to ſuſpect that they are wrong; for many who have been accuſtomed to amputate in the late ſtages of ſuch ſores, have had more ſucceſs than generally attends the practice when adviſed immediately after the injury is inflicted. And this, in the courſe of my experience, has been ſo uniformly the caſe, that ſcarcely any have died who were not previouſly ſo very much reduced as to render their chance of recovering very ſmall indeed; a ſituation which we have it always in our power to guard againſt, by adviſing the meaſure before matters are ſo far advanced.

Where the capſular ligament of a joint has not only been wounded, but much lacerated and contuſed, it may in a few caſes be proper to adviſe immediate amputation. But ſuch inſtances are extremely rare; ſo much ſo indeed, that I have never met with any, excepting where the ends of bones have been perhaps much broke, and even ſplintered at the ſame time. Where this has not been the caſe, I have uniformly been in the practice of attempting to ſave the limb; and as in ſeveral inſtances I have ſucceeded, without adding to the riſk of the patient where the trials have failed, I ſhall certainly think it right to continue it.

SECTION IX.

Of Wounds in the Face.

IN the third volume of this Work, we entered into a full conſideration of wounds of the head, which either primarily or eventually may affect the brain: and in it, and in the fourth volume, we treated of the Diſeaſes of the Eyes, Noſe, and Mouth; we ſhall now therefore refer to what was then ſaid upon theſe parts of our ſubject.

In the treatment of wounds in any part of the face, one important object is to prevent deformity. This is indeed an object in every part of the body; but in the face it is ſo eſſential, that the ſlighteſt injuries done to it require particular attention.

As every cicatrix produces ſome degree of deformity, we ſhould endeavour in every wound of the face, to have the divided parts laid as exactly and neatly together as poſſible, and to retain them by thoſe means which will be productive of the leaſt mark. In all ſuperficial wounds of the face, as well as in thoſe which run deep, when of a longitudinal direction with reſpect to the fibres of the injured part, we ſhould truſt to adheſive plaſters alone for retaining them. But wherever the edges of a wound retract much from each other, as we will not be able in any other manner to retain them, ſutures ought without heſitation to be employed; and of theſe the twiſted ſuture, deſcribed in Chap. I. Sect. V. Vol. I. ought in general to be preferred; for it prevents retraction with more certainty than the others, at the ſame time that it is not productive of more pain or uneaſineſs. In this manner it is more eſpecially neceſſary to treat all wounds of the lips, which cannot indeed in any other way be prevented from leaving much deformity: we ſhall refer, however, to the laſt volume of this Work for what was farther ſaid upon this point, when treating of the operation for the Hare Lip.

Wounds in the cheeks are apt to penetrate the ſalivary ducts leading from the parotid glands; and as this is frequently productive of much inconvenience, by the divided duct continuing to pour out the ſaliva long after the reſt of the wound is healed, it becomes an important object in many inſtances to accompliſh a cure. But as we entered into a particular conſideration of this point in the fourth volume of this Work, Ch. XXX. Sect. XIV. we muſt now refer to what was then ſaid upon it.

In the fore-head, wounds are ſometimes attended with hemorrhagies, which prove troubleſome from our not being able in the uſual manner to apply ligatures upon the arteries from whence the blood is diſcharged, wing to their running in a groove of bone; which is the caſe with a ſmall branch which paſſes out on each ſide from the internal carotid immediately above the eyebrows. In all ſuch caſes, we ſhould, in the firſt place, employ ſponge, agaric, or any mild aſtringent, along with gentle compreſſion; and when this fails, we may endeavour to pull out the bleeding veſſel by means of the tenaculum, and in this manner may tie it with a ligature. I once ſucceeded in this way with perfect eaſe, when every other method had been tried in vain.

It may ſometimes happen, however, even that this will fail. In ſuch caſes, when the hemorrhagy continues ſo profuſe as to endanger the patient, it may be proper even to remove that portion of the ſkull in which the veſſel is incaſed; or, in the hands of a nice operator, the intention may be anſwered by taking away the outer table of the ſkull only: for, in ſome caſes, theſe arteries run for a conſiderable ſpace between the two lamina of the bone; and in ſuch inſtances our object may be accompliſhed by the removal of one of them; and thus the riſk of expoſing the brain will be avoided.

SECTION X.

Of Wounds in the Trachea and Oeſophagus.

IT is neceſſary in ſome caſes to make openings into the trachea and œſophagus, for allowing food and air to paſs to the ſtomach and lungs when theſe paſſages are obſtructed. We muſt refer, however, for the method of effecting this, to Chapters XXIII. and XXIV. Vol. II. where theſe operations are particularly deſcribed: At preſent we are to conſider the method of treating wounds in the trachea and œſophagus, inflicted in ſome caſes by accident, but more frequently by deſign; as often happens where ſuicide is attempted.

The trachea is ſeldom divided longitudinally. Tranſverſe wounds running between two of the cartilages, of which it is compoſed, are more frequent. In ſome caſes theſe wounds are ſuperficial, and only penetrate the anterior part of the tube; in others, they run ſo deep as to divide it entirely.

In all longitudinal wounds of the trachea, a cure may be obtained by the uſe of adheſive plaſters alone: The lips of the wound will be eaſily brought together; and as the retraction will never be conſiderable, a proper application of adheſive plaſter will prove ſufficient for retaining them. In ſuch caſes, therefore, they ſhould be preferred to ſutures; and bandages are here inadmiſſible, as they cannot be applied with ſuch tightneſs as to have any effect upon the wound, without compreſſing the trachea ſo much as to impede reſpiration.

Even in ſlight tranſverſe wounds of this part, a cure may often be effected with adheſive plaſters; and this eſpecially, if they be aſſiſted by a proper poſture of the head, which in every wound of this nature ſhould be kept as much as poſſible bent down upon the breaſt. Indeed, if this be not duly attended to, it will often be impoſſible to produce a right reunion of the divided parts either with plaſters or any other means: It ought not therefore to be left in the power of the patient. The head ſhould be fixed with a bandage; and the moſt ſimple, as well as the moſt effectual method of doing it, is by putting a common nightcap upon the head, and a piece of broad tape or ribbon being ſewed on each ſide of it above the ear, it may now be pulled down and fixed as low as is neceſſary, by tying the tapes to a circular roller put round the cheſt. In this ſituation the head ſhould be kept for ſeveral days, till there is reaſon to imagine that the parts are firmly united.

But in tranſverſe wounds of the trachea, which penetrate deep, we ſhould not truſt to adheſive plaſters; the interrupted ed ſuture made with broad ligatures will anſwer better. I am doubtful, however, if the ligatures ſhould ever be paſſed into the trachea, as ſome have adviſed, for the irritation and cough which they excite is very apt to do miſchief by tearing aſſunder the very parts they are meant to unite; at leaſt this has been the caſe in two inſtances where I have known this method practiſed. A troubleſome cough was induced in each of them; the ſtitches were tore out; and much perplexity was thus given both to the patient and ſurgeon.

Inſtead of paſſing the ligatures round any of the cartilages of the trachea, and thus carrying them into the cavity of the tube, I have in different inſtances ſucceeded, merely by external ſtitches done in the following manner: The ſurgeon being provided with a number of needles and ligatures according to the extent of the wound, and the patient being properly placed, one of the needles ſhould be inſerted at one ſide of the wound, and be-

being paſſed ſlowly up for the ſpace of an inch between the trachea and ſkin, ſo as to include all the cellular ſubſtance and muſcular fibres which lie between them; it is now to be puſhed out along with one end of the ligature; and the other extremity of the thread being likewiſe armed with a needle, muſt in like manner be paſſed through the teguments of the oppoſite ſide. None of the ligatures ſhould be tied till they are all introduced; when this is done, and the divided edges of the cut are properly ſupported by an aſſiſtant, they ſhould be ſecured with running knots, ſo as to admit of their being eaſily untied if this ſhould be found neceſſary; adheſive plaſters ſhould be applied over the whole; and the head ſhould be firmly ſecured in the manner we have mentioned.

In paſſing the ligatures, care ſhould be taken to run the needles as cloſe to the cartilages of the trachea as poſſible, ſo as to include whatever may afford them any ſupport: For which purpoſe flat needles ſhould be employed, with a ſlight degree of curvature, as is repreſented in Plate II. fig. 5.

Whether or not this method will ſucceed where the trachea is completely divided, I cannot as yet determine, having had no opportunity in ſuch a caſe of putting it in practice: but as it has ſucceeded where all the anterior part of the tube was divided, there is reaſon to imagine that it would not often fail. At any rate, it ſhould always be propoſed in the firſt place; for even when it does not ſucceed, we are not prevented from employing other means of relief. In ſuch inſtances we are reduced to the neceſſity of paſſing the ligatures round one or more of the cartilages of the trachea, which, with a curved needle, may be eaſily done: Care ſhould be taken, however, to enter both ends of the ligature from the inſide of the trachea, when by puſhing the point of the needle outward, all riſk of doing miſchief will be avoided.

To give the practice as much chance as poſſible of ſucceeding, there ſhould be as many ligatures introduced as may ſeem in any degree neceſſary for retaining the divided ends of the trachea together: In general, three ſtitches will be found ſufficient; one in the middle of the prominent part of the trachea, and another on each ſide, towards the extremities of the cartilaginous rings.

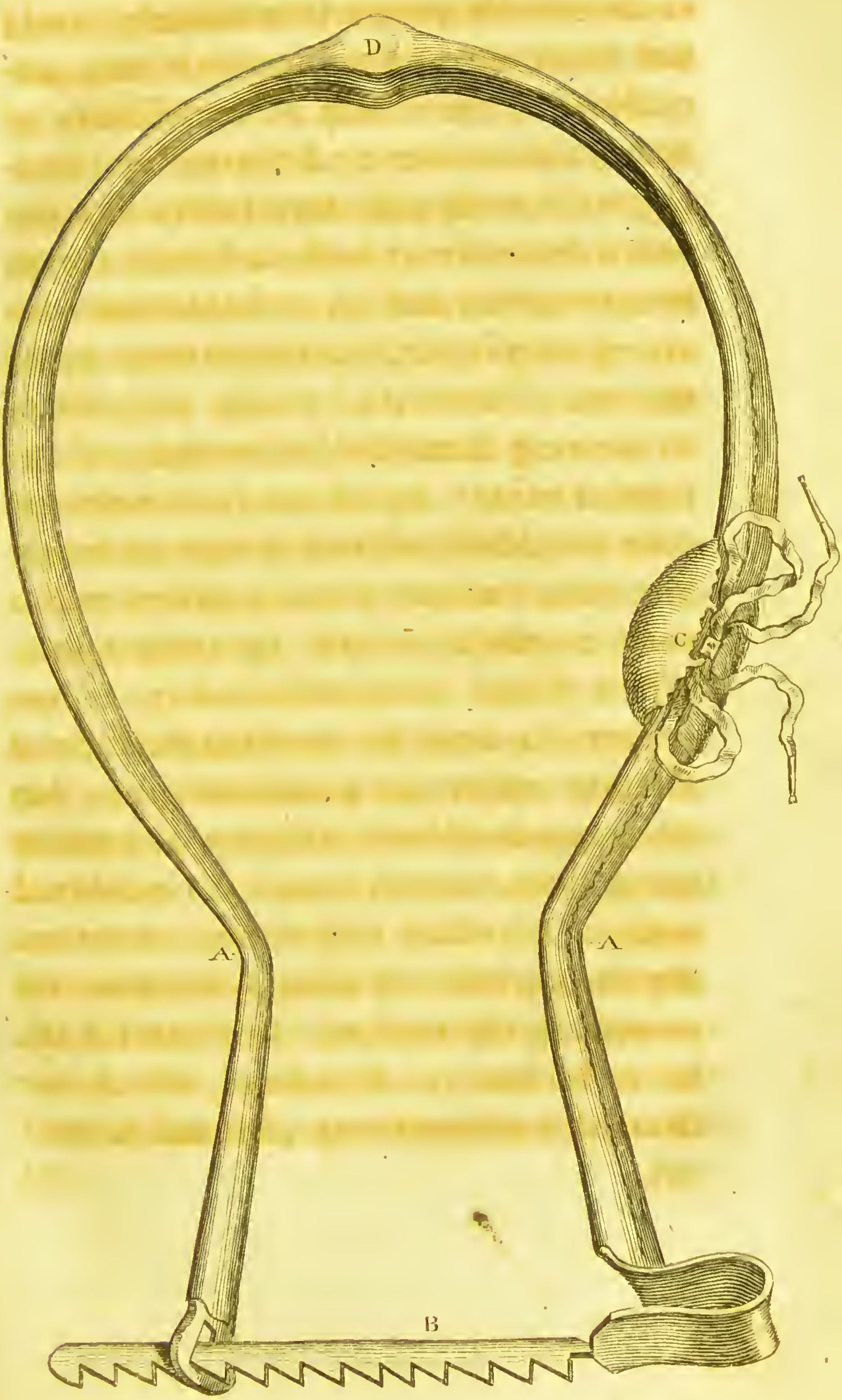
Wounds of the œſophagus are to be managed nearly in the ſame manner with wounds in the trachea: but they are more dangerous, on account of the difficulty of reaching the œſophagus from its deep ſituation; from the under part of it, when entirely ſeparated from the reſt, being apt to fall altogether within the ſternum; and from the difficulty of ſupporting the patient with proper nouriſhment.

Theſe wounds are likewiſe to be conſidered as dangerous, from their vicinity to large arteries and nerves. If the recurrent nerves are divided, the voice may be much impaired; and if any of the large branches of the carotid arteries are wounded, the patient may die from loſs of blood before aſſiſtance is procured.

In wounds of the trachea and œſophagus, our firſt object ſhould be to put a ſtop to the hemorrhagy, not only to prevent the loſs of blood, but to obviate the cough and ſickneſs, which greatly aggravate the injury, and which are the conſequence of blood finding acceſs to the ſtomach and lungs. Every veſſel therefore that pours out blood, whether artery or vein, ſhould be immediately tied with a ligature. When the wound is not extenſive, but is confined nearly to the boundaries of the trachea and œſophagus, the artery which goes to the thyroid gland will probably be the largeſt veſſel that is cut; for it is commonly in this ſituation, immediately below the thyroid cartilage, that attempts are made upon the throat. But in wounds of greater extent, the jugular veins, and even the carotid arteries, are ſometimes divided.

For the moſt part, a wound in either of theſe arteries proves immediately fatal; but when one of the carotids is only partially hurt, there may be a poſſibility of ſaving the patient by ſecuring the bleeding veſſel with a ligature both above and below the cut: at leaſt, it ſhould always be attempted; and it is probable when one artery only is cut, that the attempt would ſucceed. There is no reaſon to doubt of its proving ſucceſsful in wounds of the jugular veins: but where theſe veins are only wounded, without being cut entirely acroſs, we may with propriety endeavour to effect a cure by compreſſion. When ſlight compreſſion only is neceſſary, it may be accompliſhed by a circular roller put round the neck; but when any conſiderable degree of preſſure is required, as this cannot be employed without impeding reſpiration, we are under the neceſſity of uſing a machine for protecting the trachea. In Plate LXIX. an inſtrument is delineated, which anſwers this purpoſe very effectually.

PLATE LXIX.



As ſoon as the hemorrhagy is ſtopped, we ſhould proceed to unite thoſe parts of the œſophagus which have been divided; and in doing it, if the wound be not very extenſive, it will be of much importance, both to the operator and patient, to have it enlarged in every direction that may be neceſſary for bringing the injured parts eaſily and completely into view, by which the ligatures will be introduced with much more exactneſs than can otherwiſe be done. In paſſing the threads, the needles ſhould be entered from within, and puſhed outwards, in the manner we directed for wounds of the trachea: and in both caſes, the ends of them ſhould be left of a ſufficient length to admit of their hanging freely out of the external wound in the teguments. The interrupted ſuture appears to be beſt adapted for this operation.

In longitudinal wounds of the œſophagus, there is reaſon to imagine, from the reſult of different caſes, that cures might frequently be accompliſhed without the aſſiſtance of ligatures. But in tranſverſe wounds of this part, it is the ſafeſt practice to employ one or more ſtitches, according to the extent of the injury, by which the food will be prevented from eſcaping during the cure, and by which a reunion of the divided parts will be more readily accompliſhed.

SECTION XI.

Of Wounds in the Thorax.

§ 1. *General Remarks on Wounds in the Thorax.*

TO the conſideration of wounds of the Thorax, it will be proper to premiſe a ſhort account of the boundaries of this cavity and of the viſcera which it contains.

The thorax is an extenſive cavity, of an irregular oval figure, bounded anteriorly by the ſternum, laterally by the ribs, behind by the vertebræ of the back, above by the clavicles, and below by the diaphragm, a firm muſcular expanſion, which ſerves as a partition between it and the cavity of the abdomen.

The diaphragm does not paſs in a direct line from one ſide of the cheſt to the other; on the contrary, it falls conſiderably lower in ſome parts than in others, by which the extent of this cavity is in different parts very unequal. On cutting the thorax directly acroſs about the middle of the ſternum, and looking down upon the diaphragm, we find it round and prominent about the middle, with its edges ſtretching down to its ſeveral attachments. In its higheſt and moſt anterior point, it is fixed to the cartilago enſiformis; from whence it deſcends obliquely, and is attached as it goes along to the ſeventh, eighth, and all the inferior ribs; while, behind, it is fixed to the upper vertebræ of the loins. From this it is evident, that the back part of the thorax is much more deep and capacious than the anterior part of it: a point with which practitioners ſhould be very exactly acquainted, otherwiſe their ideas of wounds in theſe parts will often be very erroneous. Thus, without this information, we would be apt to imagine that no injury would be done to the lungs by wounds running directly acroſs the body, after entering any part of the cavity of the abdomen: whereas it is certain, that no inſtrument can paſs in this direction even at the diſtance of ſeveral inches beneath the upper part of the abdomen, without penetrating the cavity of the thorax; and, for the ſame reaſon, all wounds which paſs directly acroſs the body from the inferior and back part of the thorax, muſt neceſſarily paſs through the abdomen.

The whole cavity of the thorax is lined by a firm membrane termed the Pleura, which adheres every where to the ſternum, to the ribs, intercoſtal muſcles, and diaphragm. Each ſide of the cheſt has a diſtinct pleura; which, uniting together near the middle of the breaſt, and running tranſverſely from the ſternum to the vertebræ, form two cavities which have no communication with each other. This membranous partition is termed the Mediaſtinum. It adheres firmly, as one membrane, to the ſternum through its whole length; but the two pleuræ recede from each other near to the vertebræ, to admit of a paſſage for the aorta and œſophagus. The heart, incloſed in the pericardium, occupies a conſiderable part of the left cavity of the thorax: the reſt of this diviſion, with all the right ſide of the cheſt, is chiefly filled with the lungs. The only other parts lodged in the thorax are, the aorta, œſophagus, the thoracic duct, thymus, and large blood-veſſels about the heart. In a ſtate of health, the lungs do not adhere to the pleura; but it often happens, after inflammatory affections of theſe parts, that very firm and extenſive adheſions take place between them.

The thorax is expoſed to all the variety of wounds; but the chief diſtinction we have to attend to, is that which takes place from their degree of depth. Superficial wounds, which do not run deeper than the common teguments, if they are rightly treated, will ſeldom be productive of any important conſequences; while even the ſlighteſt injury which penetrates the cheſt will, in ſome inſtances, be attended with the moſt alarming ſymptoms; and theſe again will be of a more dangerous nature when any of the viſcera lodged in the thorax are wounded.

Wounds of the thorax may therefore be divided into three kinds: Thoſe which affect the common teguments only; ſuch as merely penetrate the cavity without doing any further injury; and thoſe by which ſome of the viſcera are likewiſe hurt.

Our firſt object in wounds of this kind is, to diſcover whether they have penetrated the cavity of the cheſt or not;

which in general we may do by attending to the following circumſtances: By the patient being put into that ſituation in which the wound was inflicted, and in this ſtate making a particular examination with the fingers, or probe, of the direction and depth of the wound; by the form of the inſtrument, and the length to which it ſeemed to be puſhed; by any mild liquid which may be injected returning immediately or lodging in the wound; by air being diſcharged in conſiderable quantities during reſpiration; by an emphyſematous ſwelling appearing over the contiguous teguments; by the quantity of blood diſcharged from the wound being conſiderable or otherwiſe; by the appearance of the blood; by blood being diſcharged from the mouth; and by the ſtate of the pulſe and reſpiration.

Each of theſe circumſtances we ſhall conſider in the order they are mentioned.

It is obvious that it is of importance

to pay attention to the poſture of the patient during the examination of every wound; but it is in none more ſo than in wounds of the thorax, where, from the variety of muſcles which may be injured, and from the mobility of the ribs, wounds may in one poſture appear to be quite ſuperficial, which in others are found to penetrate to a great depth; for if any part of a rib, of a muſcle, or even of the cellular ſubſtance, be forced by the poſture of the patient into the courſe of a wound, neither the finger, probe, nor injections, will paſs with that eaſe which the free examination of ſuch injuries requires. In all ſuch caſes, therefore, before we proceed to examine the direction and depth of the wound, the patient ſhould be placed as nearly as poſſible in the poſture he was in at the time of receiving it.

In ſome caſes, the opening is ſo large, that we diſtinguiſh with the eye whether a wound has penetrated to the depth of the cavity or not; or we introduce one of the fingers, which is better than any probe when it can be paſſed forward without lacerating the contiguous parts: But when the opening is too ſmall to admit of this, we are under the neceſſity of uſing a probe; and the beſt ſubſtance for this purpoſe is a common bougie. When we mean by probing a ſore to diſcover whether there is any extraneous body lodged or not, or whether the bones beneath are carious or in a ſound ſtate, a metallic probe is to be preferred: but for examining the depth and direction of a wound, nothing anſwers ſo well as a firm and tolerably thick bougie; which neither gives ſo much pain to the patient, nor is it ſo apt to be puſhed beyond the depth of the wound into the contiguous ſoft parts, as the common ſmall probe when uſed with freedom. This will not often indeed occur with practitioners of experience, as they will not only uſe this inſtrument in every caſe with caution, but will be ſenſible that it is often unneceſſarily employed: For even in wounds of the thorax, we ſhould not ſearch for their depth with too much anxiety; as, by doing ſo, more harm may be done than could be compenſated by any advantage to be derived from the diſcovery. It is highly proper to examine, in a cautious way, into the direction and depth of ſuch wounds; but the younger part of the profeſſion ſhould know, that much harm has been done by reſearches of this kind being carried too far: and they ſhould likewiſe know, that it is perhaps of more importance to be acquainted with the direction of an external punctured wound, which does not run deeper than the cellular ſubſtance above the ribs, or perhaps to the intercoſtal muſcles, than to know, by means of the probe, whether a wound reaches to the cavity of the cheſt or not: for even where we find, in the moſt evident manner, that a wound goes to the depth of this cavity, if no bad ſymptoms occur, little or no advantage is obtained from the diſcovery; and where ſuch ſymptoms take place as are known to proceed from a penetrating wound, and of which we ſhall afterwards treat, we are thus rendered equally certain of the nature of the caſe as if a probe had paſsed eaſily into the thorax.

Some advantage may be procured in inquiries of this kind, from our attending to the ſize and figure of the inſtrument; the direction it ſeemed to take; and the depth to which it was puſhed: Theſe are points of which we cannot always receive exact information; but it is ſometimes otherwiſe, particularly in duels, where a ſurgeon is frequently attending, and where the byſtanders are often ſo much intereſted as to be able to give diſtinct intelligence upon this and every other point of importance.

When we are rendered certain, by either of theſe modes of inquiry, of the depth of a wound, it would be unneceſſary as well as improper to carry our reſearches farther: but when the point remains in doubt, it may be ſometimes determined by throwing in injections of any mild liquid. If the liquor returns immediately, there will be reaſon to conclude that the wound is ſuperficial, or at leaſt that it does not paſs into the thorax; but when it lodges either altogether, or in any conſiderable part, without raiſing any outward tumefaction, there will be no cauſe to doubt of its having reached the cavity. In throwing in liquids for this purpoſe, either the common ſyringe, Plate LXIV. fig. 4. may be employed, or a bag of the elaſtic gum, mounted with a pipe as in Plate XXIX. fig. 3. but it ſhould never be done with much force, as in this manner parts might be tore aſunder which were not previouſly hurt; and the mildeſt liquor only ſhould be uſed, as it might prove dangerous to apply any thing poſſeſſed of ſtimulating powers to the ſurface of an irritable part. Honey and water are commonly uſed for this purpoſe; but warm water alone is leſs irritating, and ſhould therefore be preferred.

When air is diſcharged by the wound during inſpiration, there will be cauſe to ſuſpect that the lungs are wounded. But although this is uſually conſidered as one of the moſt certain proofs of a wound having penetrated the cheſt, yet it is proper to remark, that it is far from being deciſive. Wherever the lungs adhere to the pleura, a wound may penetrate to a conſiderable depth; nay, it may paſs entirely acroſs the body, without entering what is properly termed the Cavity of the Cheſt: and we know that air is frequently diſcharged at wounds in the thorax where there is no reaſon to ſuſpect that the lungs are hurt; for when no adheſions take place between the pleura and lungs, the external air, if it gets acceſs by a penetrating wound, will paſs between them, and will neceſſarily be forced out at every inſpiration; a circumſtance which invalidates the certainty of this teſt. In judging therefore of the weight which is due to it, we ſhould, in the firſt place, cauſe the patient make ſeveral full inſpirations, in order to diſcharge any of the external air that may be collected; and at the end of each, the contiguous ſkin ſhould be ſo drawn over the wound, as to prevent any more from finding acceſs. In this manner the whole will ſoon be evacuated; when, if we ſtill find that air ruſhes out during inſpiration, we may with certainty conclude that the lungs are injured.

Emphyſematous ſwellings ſometimes appear in conſequence of wounds of the thorax, by the air from the lungs finding acceſs to the ſurrounding cellular membrane. This, however, will ſeldom happen in extenſive wounds; as in theſe the air from the lungs will readily be diſcharged outwardly: but it is by no means unfrequent in punctured wounds, eſpecially in ſuch as have an oblique direction. It is obvious, however, that although this is a certain proof of the lungs being injured, that it may ſometimes happen without any communication with the cavity of the cheſt, for the reaſon mentioned in the laſt paragraph.

When the quantity of blood diſcharged from theſe wounds is conſiderable, we may with much certainty conclude, that they have not merely paſſed into the cheſt, but that ſome of the contained viſcera are wounded; for, excepting the intercoſtal arteries, which run upon the inferior border of each rib, all the other blood-veſſels of the external parts are here very ſmall: and as we can by compreſſion eaſily put a ſtop to hemorrhagies from the intercoſtal veſſels, we may in almoſt every inſtance diſcover immediately whether the blood be evacuated from the cheſt or not.

Even the appearance of blood diſcharged from theſe wounds may lead to a knowledge of their depth. It is a known fact, that blood coming directly from a wound in the lungs, has a more red, and particularly a more frothy appearance, than blood from any other part, owing probably to its being mixed with the air in the bronchiæ; ſo that when blood aſſumes this appearance, we have much cauſe to conclude that the lungs are injured.

When blood is ſpit up by the mouth immediately after a wound in the thorax, there will be no reaſon to doubt of the lungs being hurt. For although we ought not to conclude from the abſence of this ſymptom, that the lungs have not ſuffered, as they are often wounded without any blood being diſcharged by the mouth; yet we may be convinced, that ſome injury is done to them when blood is actually diſcharged from them.

In our inquiries into the nature of ſuch wounds, the ſtate of the pulſe and of reſpiration ſhould be particularly attended to. In wounds which do not penetrate deeper than the common teguments, neither the pulſe nor breathing are at firſt affected, nor do they produce any other conſequences for the firſt two or three days than wounds in any other part of the body: but wounds which go to the depth of the thoracic cavity, and more eſpecially when they affect the lungs or any other parts contained in it, may often be diſtinguiſhed by their producing an immediate effect both upon the pulſe and breathing. When the lungs are injured in a part where they adhere to the pleura, the wound may paſs to a conſiderable depth without any extravaſation taking place into the cavity of the cheſt; in which caſe no immediate effect may enſue: but when either blood or air finds acceſs to this cavity, the lungs are immediately compreſſed, by which the breathing becomes difficult, and the pulſe feeble, oppreſſed, and intermitting; ſo that when theſe ſymptoms take place, we may at once give a decided opinion of the nature of the caſe.

By due attention to theſe circumſtances, we may, in almoſt every caſe of this kind, determine with much certainty whether a wound has reached the cavity of the thorax or not: and this being fixed, we are next to proceed to the method of treatment. We ſhall firſt attend to thoſe wounds which do not go deeper than the common teguments or muſcles, and ſhall afterwards treat of ſuch as penetrate deeper.

§ 2. *Of Wounds in the external Teguments of the Thorax.*

When wounds of the thorax do not go deeper than the ſkin and cellular ſubſtance they do not give any cauſe for anxiety, as they heal with the ſame eaſe, and are to be treated in the ſame way with ſimilar wounds in other parts of the body: but when they reach the muſcular ſubſtance between the ribs, and eſpecially when they run among theſe parts for a conſiderable way like ſinuſes, there is always reaſon to fear that at laſt they may penetrate the cavity of the thorax; for when ſores in this ſituation are not in every reſpect properly treated, and if any matter that forms in them be not regularly diſcharged, it is very apt to paſs deeper and deeper, till at laſt it makes its way through the pleura itſelf. In all ſuch caſes, therefore, it ſhould be the firſt object with practitioners to give a free vent to the matter. In open inciſed wounds, all that is neceſſary is, by means of ſoft eaſy dreſſings, to preſerve their lips or edges from adhering till they fill with granulations from the bottom: but punctured wounds ſhould either be laid open through their whole extent, or a ſeton ſhould be paſſed from one end of the ſinus to the other. When they are not very extenſive, the ſhorteſt and eaſieſt method is to lay them freely open with a ſcalpel and director, and then to heal them from the bottom like inciſed wounds from any other cauſe: but when a puncture runs to any conſiderable length, the method of cure by a ſeton anſwers better. By paſſing a ſeton along the courſe of the ſinus, it is not allowed to heal outwardly, till the whole be equally filled up; and this being accompliſhed, if the cord be gradually diminiſhed, when it is at laſt removed, a moderate degree of preſſure continued upon the parts for a few days longer, will ſeldom fail to effect a cure. Some, indeed, adviſe us to attempt the cure of all ſuch ſores with preſſure alone. But although this practice will often prove ſucceſsful in other parts of the body, particularly in the extremities, where preſſure can be applied with exactneſs along the whole courſe of a ſinus, and be continued for a ſufficient length of time without riſk; yet in wounds of the thorax, the ſame advantages are not to be expected from it: for here the conſtant motion of the ribs prevents us from applying a continued equal preſſure without impeding reſpiration in a very diſagreeable manner. When a cure is to be attempted by preſſure alone, it muſt be done with a roller paſſed firmly round the thorax, ſupported by what is termed a Scapulary, put over the ſhoulders: But when a ſeton has been previouſly uſed, any preſſure that is neceſſary may be applied with ſlips of adheſive plaſter laid along the courſe of the wound, and fixed upon the contiguous ſkin.

This method of cure, by laying the ſinuſes open, or by the inſertion of a ſeton, to thoſe not much verſant in this branch of practice, may appear to be unneceſſarily ſevere; for in many of the older writers we are told, that our object may be accompliſhed in a much more eaſy manner, namely, by keeping the external openings of the ſores pervious by the uſe of tents till they are firmly healed from the bottom. In wounds which penetrate to the cavity of the thorax, tents, eſpecially thoſe of the hollow kind, prove often uſeful; and as they may be uſed with perfect ſafety, they ſhould not be ſo generally condemned as ſome modern practitioners have affected to do. But in punctured wounds which do not go to this depth, as our great object is to avoid every riſk of the matter finding acceſs to the thorax, whatever can tend to impede the diſcharge of it, ſhould by all means be avoided. So that in ſuch caſes tents ſhould never be uſed; they would frequently do much miſchief in the manner we have mentioned; in many caſes they would fail entirely; and if they ſhould ever ſucceed, the cure would prove much more tedious, and often more painful, than the mode of treatment we have adviſed.

In every wound of any importance, it is proper to pay particular attention to the regimen of the patient; a point upon which the event of the caſe very often depends: For we frequently obſerve injuries of this kind treated in every other reſpect with propriety; and yet the practitioner fails, from the patient being allowed too much freedom in food, drink, and exerciſe. In wounds of the thorax, attention to theſe points is ſtill more neceſſary than in ſimilar affections of any other part: for as the contained parts are highly neceſſary to life, and as they are very liable to inflammation, even from injuries that do not penetrate deep, every precaution ſhould be employed that can probably tend to prevent it. Hence, for ſeveral days at leaſt, or even till there does not appear to be any farther chance of the parts becoming inflamed, the patient ſhould be kept upon a low, cooling diet; animal-food and ſtrong liquors of every kind ſhould be avoided; the bowels ſhould be kept open with mild laxatives; and when the pulſe requires it, a due proportion of blood ſhould be evacuated. Reſt of body and perfect quietneſs is of much importance in theſe wounds; for they are affected by the leaſt degre of motion: even coughing, laughing, or much ſpeaking, is apt to hurt them, and ſhould therefore be as much as poſſible avoided.

§ 3. *Of Wounds which penetrate the Cavity of the Thorax.*

Wounds penetrating the thorax are always to be conſidered as hazardous, and therefore merit the utmoſt attention:

Even ſuch as merely penetrate the cheſt are often attended with the moſt important conſequences; but the contiguity of the lungs and other viſcera adds much to the danger. At preſent, we are to treat of ſimple penetrating wounds, not connected with any injury done to the contained parts.

It is now known, that in a ſtate of health the lungs fill the ſpaces allotted for them in the two ſides of the thorax ſo completely, that they are every where in contact with the pleura both in the ſtate of inſpiration and expiration: And it is alſo known, that great diſtreſs in breathing is induced by air, blood, or any extraneous matter being admitted between them. Now, in penetrating wounds of the thorax, excepting where the lungs morbidly adhere to the pleura, and which we do not here ſuppoſe to be the caſe, it is ſcarcely poſſible to prevent both air and blood from being admitted: The external air ruſhing in at the wound ſoon ſpreads over the whole correſponding cavity; and when the intercoſtal artery or any other blood-veſſel is divided, if the external opening be not ſufficiently large, any blood that is evacuated is very apt to fall down between the pleura and lungs to the very bottom of the cheſt; by which difficulty of breathing immediately takes place, along with all the other ſymptoms which uſually attend a compreſſed ſtate of the lungs.

In Volume II. Chapter XXII. we have entered into a full conſideration, not only of the ſymptoms induced by the collection of fluids in the cheſt, but of the method of relieving them by the operation of the paracenteſis: To avoid repetitions, we ſhall now refer to what was then ſaid upon this part of our ſubject, and at preſent ſhall offer a few obſervations upon the means of preventing ſuch collections as may require the aſſiſtance of that operation.

In wounds which do not penetrate to the depth of any of the viſcera, but which merely pierce the pleura, almoſt the only artery which can be cut that can afford any quantity of blood, is the intercoſtal; and as it is of a conſiderable ſize, no time ſhould be loſt in ſecuring it whenever it is found to be wounded. As it runs in a groove in the inferior edge of the rib, it is difficult to put a ligature about it; but with attention this may always be accompliſhed.

In free inciſed wounds, the bleeding orifice will be brought clearly into view; but in ſmall punctured wounds, as the artery cannot be diſtinctly ſeen, there is a neceſſity for laying the parts ſufficiently open with the ſcalpel. When the artery is thus laid bare, various means have been propoſed for ſecuring it. For the reaſon juſt mentioned, a crooked needle cannot be paſſed round it. We are therefore told by ſome, that the only method of doing it is to paſs a firm broad ligature altogether round the rib, and by means of it to tie a doſſil of lint upon the orifice in the artery: While others condemn this practice, from the injury which it muſt neceſſarily do to the pleura; for this membrane can ſcarcely be ſeparated from the rib, ſo as not to be included in the ligature; and different inſtruments have therefore been propoſed for obviating this inconveniency. The intention of all of them is to compreſs the intercoſtal artery, without hurting the pleura; but as none of them I have met with anſwer this purpoſe, I do not think it neceſſary to delineate them: thoſe who wiſh to ſee them may look into the ſecond volume of Memoirs of the Royal Academy of Surgery at Paris.

It is luckily, however, in our power to ſecure this artery in a much more ſimple manner. By dilating the wound ſufficiently, we may with a tenaculum, ſomewhat more bent at the point than uſual, draw the bleeding veſſel out of its groove, ſo as to tie it in the ordinary way; at leaſt in thin people it may be eaſily done: and where it is found, either from the ribs being deeply covered with fat, or from any other cauſe, that it cannot be ſecured in this manner, it may always be done in the manner we have mentioned, by paſſing a firm broad ligature round the rib, and by means of it tying a ſmall doſſil of lint upon the bleeding artery. In this way a portion of the pleura will no doubt be included in the ligature: but it does not appear from experience, that this is productive of any thing bad; and with ſufficient caution we may always with certainty avoid the lungs. When the lungs do not adhere to the pleura, they collapſe in ſome degree immediately on the external air finding acceſs through the wound to the cavity of the cheſt. And even when they do adhere, we may eaſily ſeparate as much of them with the point of the finger as will admit of the paſſage of the ligature.

When a practitioner is called immediately, he may in this manner prevent any quantity of blood from being emptied into the thorax; and as ſoon as the hemorrhagy is ſtopped, he ſhould endeavour to expel all the air that has found acceſs by the wound to the ſurface of the lungs; for till this is accompliſhed, the breathing will remain oppreſſed, nor will the patient be able to bear the application of the neceſſary dreſſings. In the chapter above alluded to, we have mentioned different methods of expelling air from the ſurface of the lungs; but the ſimpleſt and eaſieſt is this: While the wound yet remains open, let the patient, in a ſlow gradual manner, make a full inſpiration, by which a conſiderable part of the collected air will be diſcharged. This being done, the ſkin muſt be inſtantly drawn over the ſore, ſo as to cover it completely during expiration; and if the wound be moderately opened during inſpiration, the whole quantity will thus be ſoon expelled. After which, the lips of the wound ſhould be drawn exactly together, and in this ſituation ſhould be ſecured by different ſlips of adheſive plaſter, care being taken to ſupport the whole by a proper application of the napkin and ſcapulary bandage.

In this manner wounds of the thorax will frequently heal, which, if left to themſelves, or if treated in the uſual way by allowing them to remain open, might be productive of much diſtreſs: But in ſome caſes, either from a conſiderable quantity of blood having been thrown out from the intercoſtal artery before the ligature was applied; from the oozing of blood from the ſmaller ramifications of the intercoſtal arteries; or perhaps from a ſubſequent formation of pus; oppreſſed breathing will ſupervene, notwithſtanding all that can be done to prevent it.

When this takes place as a conſequence of a wound in the cheſt, from the formation of matter, an opening ſhould be made to diſcharge it in the manner we have adviſed in the chapter on Empyema; and in this caſe the opening ſhould be made in the moſt depending part of the thorax. But when it occurs immediately after a wound, and while the blood yet remains in a fluid ſtate, we may often be able to diſcharge it at the wound itſelf: and when this can be done, it ſhould always be preferred; for we are not to imagine that the thorax can in any part be laid open without ſome riſk of harm being done by it. When ſymptoms, however, of oppreſſed breathing occur from a wound in the upper part of the thorax, as we will not be able to diſcharge the blood by it, we are under the neceſſity of making a perforation in the under part of the cheſt as ſoon as they become in any degree formidable. It is proper, however, to obſerve, that this operation ſhould never be adviſed while the ſymptoms are moderate: for we have daily inſtances of ſmall quantities, not only of blood but of other fluids, being abſorbed; and as the riſk attending a perforation in this place is probably greater than that which occurs from ſmall quantities of blood being allowed to remain, it ſhould not be attempted as long as the breathing continues tolerably free.

§ 4. *Of Wounds of the Lungs.*

We have already, in the courſe of this ſection, enumerated the ſymptoms which indicate a wound in the thorax to have penetrated the lungs. And although the danger in this caſe is greater than in wounds which merely penetrate the pleura, yet the method of cure ſuited to the one is ſo nearly the ſame with what we have adviſed for the other, that it is ſcarcely neceſſary to enlarge farther upon it.

It is proper, however, to obſerve, that as the riſk attending wounds in the lungs is conſiderable, the caution with which they are treated ſhould be proportionally great. Inſtances indeed have occurred of their healing with eaſe and ſafety; but theſe are ſo rare, that we do not heſitate in ſaying, that every injury done to them is to be conſidered as hazardous.

The danger which attends them originates, in the firſt place, from the hemorrhagy being apt to proceed farther than the ſtrength of the patient will bear; and, afterwards, from abſceſſes forming in the lungs, which are apt to terminate in pthiſical affections.

The hemorrhagy is moſt readily checked by plentiful veneſection, which in ſuch caſes ſhould at once be carried ſo far as to induce fainting; by the patient being kept in a cool apartment and at perfect reſt; by the uſe of cooling laxative medicines; and by a low regimen. Beſides reſt of body, it is of the utmoſt importance to keep the lungs as free from action as poſſible. Hence coughing, laughing, and even much ſpeaking or deep inſpirations, ſhould be rigidly guarded againſt. Attention to this point is neceſſary in every wound of the thorax, but it is more particularly ſo in thoſe which affect the lungs; for when this viſcus is wounded, it can never be fully diſtended with air without ſtretching every blood-veſſel that has been hurt.

Notwithſtanding, however, of our utmoſt attention, the patient will ſometimes ſink under the loſs of blood; in other caſes, blood will be collected in conſiderable quantities betwixt the pleura and lungs, ſo as to impede reſpiration; or abſceſſes will form, as we have obſerved above, in the ſubſtance of the lungs.

We have already conſidered the method of treatment in collections of blood ſeated between the pleura and lungs: at preſent, we ſhall offer a few remarks on the management of abſceſſes in the lungs.

Matter collected in the ſubſtance of the lungs from a wound, may be diſcharged in three different ways. It may be ſpit up by the mouth; it may be diſcharged by the abſceſs burſting into the wound itſelf; or it may be emptied into one or other of the cavities of the cheſt between the lungs and pleura.

When an abſceſs in this ſituation opens

into the bronchiæ, there may often be ſome riſk at firſt of immediate ſuffocation; but when this danger is over, by a conſiderable quantity of the matter being diſcharged, if there is no conſtitutional or hereditary pthiſical tendency, a cure will often be accompliſhed by the means uſually adviſed in ſuch caſes, namely, by a diet that is light and of eaſy digeſtion, and at the ſame time ſufficiently nouriſhing; and by daily moderate exerciſe, by which any matter collected in ſuch abſceſſes is brought up with more eaſe than by any other means. A ſea-voyage too anſwers particularly well for this purpoſe, at the ſame time that it tends to brace and invigorate the conſtitution; but when this cannot be obtained, we adviſe riding on horſeback. When pus collected in the lungs is diſcharged in this manner, the buſineſs of a ſurgeon becomes altogether unneceſſary; but when the abſceſs either empties itſelf into one of the cavities of the cheſt, or points outwardly at the wound, we have it often in our power to ſave the patient by an operation, when otherwiſe he would inevitably die.

When an abſceſs burſts into one of the cavities of the cheſt, the matter ſhould be diſcharged in the manner we have mentioned in the XXIII. Chapter above alluded to: But when the wound by which the collection is produced remains open, ſo as to admit of the matter to point towards it, as ſoon as this is diſcovered, either by a ſmall oozing of pus taking place, or by the introduction of the finger between two of the ribs, we ſhould at once determine on treating it on the ſame principles and in the ſame manner with abſceſſes in any other part of the body, namely by making an opening into it of a ſufficient ſize for diſcharging the matter. The delicate nature of the part in which the matter is ſeated may be a means of deterring ſome from adopting this practice; but it does not require much argument to ſhow, that a patient in ſuch circumſtances runs much more riſk of ſuffering by the matter being allowed to remain, than by making an opening into the abſceſs. By the laſt meaſure he avoids the hazard of immediate death, which often happens from large abſceſſes burſting into the bronchiæ; at the ſame time that it prevents the matter from paſſing into the cavity of the cheſt, between the pleura and ſurface of the lungs; and thus obviates the neceſſity of a ſecond operation. Nay, in caſes of this perilous nature, I would even go farther: When from a previous diſcharge of matter we are certain that an abſceſs has formed in the lungs, as a conſequence of a wound; when a ſtoppage of this diſcharge takes place, and is ſucceeded by all the uſual ſymptoms of a freſh collection of matter, ſuch as an increaſed difficulty in breathing; difficulty in lying on the ſound ſide; frequent ſhivering fits; and a hectic pulſe; as in ſuch a ſituation there will be no reaſon to doubt of matter being collected, and as the patient muſt remain in the utmoſt hazard till it be diſcharged, I ſhould think it advisable to enlarge the external wound not only of the common teguments, but of the intercoſtal muſcles, and to extend the opening for the ſpace of two or three inches; by which more freedom will be given for ſearching with the finger for the ſeat of the abſceſs: and whenever it is diſcovered, I would not heſitate, at whatever depth it may be, to open it, by running a biſtoury along the finger, and puſhing it ſlowly into it. In the courſe of my own experience I have had two caſes of this kind; in which, by this deciſive practice, I had the ſatisfaction of ſaving two lives, which otherwiſe muſt in all probability have been loſt. This was the opinion of other practitioners who attended along with me; and I was ſo much convinced, in both caſes, of matter being collected internally which produced the danger, and of nothing being able to ſave the patient but the diſcharge of it, that after warning the patient of his ſituation, and receiving his approbation, I was reſolved to carry the opening into the ſubſtance of the lungs to the full depth of my finger, rather than to leave him to his fate. In both inſtances I found it neceſſary to go to nearly the length of my finger; and at this depth I was ſo fortunate as to reach an abſceſs containing at leaſt half an Engliſh pint of matter. The patients in both caſes were inſtantly relieved; and although they were previouſly ſuppoſed to be in the utmoſt danger, with ſcarcely a poſſibility of recovering, they are now, after ſeveral years have elapſed, in perfect health.

In making an opening into ſuch a deep-ſeated abſceſs, the inciſion ſhould be carried forward in the moſt gradual manner, ſo that no more of the lungs may be injured than is altogether neceſſary: But when once the matter appears, the abſceſs ſhould be laid as freely open as may be proper for an entire diſcharge of it.

In the ſubſequent treatment of an abſceſs of this kind, much attention is required in preſerving a proper aperture for the diſcharge of any matter that may afterwards form in it: for if this be neglected before the abſceſs is filled up from the bottom, a new collection will ſoon take place, and the patient will be reduced to the ſame ſtate of uncertainty and danger he was in before. In wounds which do not penetrate deeper than the teguments or muſcles of the thorax, we have obſerved above, that no kind of tents ſhould be employed; and have rather adviſed them to be laid open thro' their whole length, or to be treated by means of a ſeton, as we do ſores of a ſimilar nature in other parts of the body. But as this is impracticable in penetrating wounds, we are in theſe under the neceſſity of inſerting a tube into the opening, and of continuing it of a ſufficient ſize and length during the whole courſe of the cure: it ought indeed to be continued as long as any matter is diſcharged. Tubes of lead being more ſoft and pliable than thoſe of any other metal, are therefore to be preferred: They ſhould be broad, and of a round oval form rather than altogether round; and they ſhould always be furniſhed with a brim conſiderably broader than the opening of the ſore, to obviate every poſſibility of their falling into the cheſt. By inattention to this point, a tube of four inches in length, and of a correſponding thickneſs, paſſed altogether into the cavity of the breaſt of a gentleman who had uſed it for ſome time; and notwithſtanding various attempts to extract it, it ſtill remains lodged. It was fixed in the uſual way, by a thread, to a bandage going round the body; but the thread breaking, it immediately ſlipped in. This happened upwards of a year ago. The patient does not indeed experience much uneaſineſs from it; but it had an evident effect in increaſing the quantity of matter diſcharged from the wound.

I have met with ſome caſes of wounds in the cheſt, where ſolid tents have anſwered the purpoſe equally well with tubes; and they may always be uſed when the parts do not contract ſo cloſely round them as to prevent the matter from being freely diſcharged: But whenever they ſtop up the paſſage ſo much as to produce any collection of matter from one dreſſing to another, they ſhould undoubtedly be laid aſide, and tubes uſed inſtead of them.

As tents had been uſed for a great length of time in almoſt every wound which penetrated beyond the common teguments, Belloſte, and ſome other ſurgeons of obſervation, ventured at laſt to lay them in a great meaſure aſide. We have already had occaſion to obſerve, that this, to a certain length, was highly proper; but I cannot agree with ſome modern practitioners who aſſert, that tents and tubes do miſchief in every caſe, and that they ſhould never be employed. Where the diſcharge from a wound or abſceſs will continue free and uninterrupted, till a cure is effected by the parts filling up from the bottom, I would never adviſe either a tent or a tube to be uſed. But when we find that the external opening of a wound heals up long before the parts beneath are united; and that matter collects and burſts out again, as in different inſtances has happened in the courſe of my experience in penetrating wounds of the cheſt, it muſt be from want of experience only, or from a deſire of appearing ſingular, that we refuſe to employ the only certain method with which we are acquainted of obviating this inconvenice, and of ſaving the patient a great deal of pain, trouble, and danger.

In extenſive wounds of the thorax, where any portion of the ſternum or of the ribs have been removed, a portion of the lungs ſometimes protrudes, and does not readily recede. When a practitioner is called ſoon after the accident, the protruded part ſhould be replaced as quickly as poſſible: but when a portion of the lungs has been long expoſed to the air, and eſpecially if it has been much lacerated by the accident, we ſhould, in the firſt place, ſee whether or not it be in a ſtate of mortification; and all that is clearly and completely mortified ſhould certainly be cut off before the remaining ſound parts are replaced. If the inciſion be confined to a part that is entirely gangrenous, there will be no riſk of inducing either hemorrhagies or any other ſymptom; and by removing parts which are in this ſtate of diſeaſe, we will prevent all the bad conſequences which might enſue from their being returned into the thorax.

§ 5. *Of Wounds of the Heart and large Veſſels connected with it, and of Wounds of the Thoracic Duct.*

In wounds of the heart and large blood-veſſels connected with it, as theſe parts lie very deep, and as a ſound ſtate of them is ſo immediately neceſſary for life, the utmoſt danger is always to be dreaded, ed, nor is the greateſt exertion of practitioners able to leſſen it. Of ſuch a hazardous nature indeed is every injury of this kind, that we may with propriety conſider every wound of theſe parts as mortal: For although we are told in books, of the heart itſelf having been wounded without any fatal conſequences enſuing, there is much cauſe to ſuſpect that theſe accounts are founded on fallacy or error. We can however conceive that the heart may be ſlightly injured without proving inſtantly fatal; but even the ſlighteſt wound in it muſt probably at laſt end in death: For the weakneſs induced in this manner upon a particular part, will render it very liable to yield to the ſtrong and conſtant action of this organ. And when once an aneuriſm is formed in it, it will be apt to proceed with rapidity to a fatal termination.

The moſt probable method of preventing this, or at leaſt of delaying it, is to leſſen the action of the heart by copious blood-letting, by low diet, keeping the

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bowels moderately open, and avoiding every kind of fatigue: If in ſuch circumſtances it is poſſible to ſave a patient, theſe will be the moſt certain means of doing it; at any rate they will tend to prolong life, which in ſome caſes is of ſo much moment, that a few days or even a few hours may be of the utmoſt importance.

The ſame obſervations are applicable to wounds in the large blood-veſſels about the heart. They are to be conſidered as of equal importance and danger, and to be treated by the ſame means with wounds of the heart itſelf.

There is ſtill another organ of importance ſeated in the cheſt, which it is proper to mention here, viz. the thoracic duct; for although wounds in this canal will in moſt inſtances terminate in death, yet ſome advantage may, in particular circumſtances, be derived from an attentive treatment of them. The thoracic duct, after leaving the receptaculum chyli, runs along the ſpine near to the aorta; and at the fifth or ſixth vertebra of the back, it paſſes behind the aorta; and aſcending to the left ſubclavian vein, it there empties the chyle.

We judge of the thoracic duct being wounded, from the part at which the wounding inſtrument entered; from the diſcharge being either altogether white like chyle, or mixed with a conſiderable proportion of it; and from the patient becoming daily weaker than he ought to do from a wound of the ſame ſize in any other part, owing to the nutritive part of his food being carried off before any advantage is derived from it.

With a view to prevent the diameter of this canal from being diſtended, which at the ſame time will tend to leſſen the extent of the wound, the patient ſhould be kept upon a cooling and very ſpare diet: any food which he takes ſhould not be at regular meals, but in ſmall quantities frequently repeated; nor ſhould he be permitted to take a large draught even of the weakeſt liquor. The bowels ſhould be kept lax; bodily exertion of every kind, and much ſpeaking, or whatever tends to quicken reſpiration, ſhould be avoided.

§ 6. *Of Wounds of the Diaphragm, Mediaſtinum, and Pericardium.*

WE judge of the Diaphragm being injured, from the ſituation of the wound, and from the nature of the attending ſymptoms. As this muſcle is in conſtant action during reſpiration, any injury done to it is neceſſarily attended with difficulty in breathing; with much pain during inſpiration, not merely in the wound itſelf, but over all thoſe parts of the cheſt to which the diaphragm is attached: The patient complains of pain over all the region of the ſtomach; ſickneſs, vomiting, and a troubleſome degree of hickup take place; pains in the ſhoulders ſometimes occur, together with cough, delirium, a quick hard pulſe, and other ſymptoms indicating inflammation and fever. Involuntary laughter is mentioned too as a ſymptom which injuries done to the diaphragm ſometimes produce.

It is a common idea among practitioners, that wounds in the tendinous part of the diaphragm will in every caſe prove mortal, but that injuries done to the muſcular parts of it do not ſo readily prove dangerous. There is much reaſon, however, to believe, that few wounds in the diaphragm are ever cured, whether they be ſituated in the tendinous or muſcular parts of it; nor is it evident from obſervation, that there is more danger to be dreaded in the one caſe than in the other.

The ſymptoms of which we have moſt reaſon to be afraid, are thoſe which proceed either from inflammation or irritation. With a view to prevent their acceſſion, or to moderate them when they have already appeared, blood-letting is to be chiefly depended on; together with gentle laxatives; large doſes of opiates conjoined with muſk; warm fomentations over the abdomen and thorax; quietneſs; and low diet.

By theſe means ſtrictly purſued, a patient, in ſuch circumſtances, will have perhaps a better chance of doing well than by any other mode of treatment; but his recovery will by no means be certain. A ſtrict antiphlogiſtic courſe, and large doſes of opium, may probably obviate all the primary ſymptoms. But however ſmall a wound may at firſt be in the diaphragm, the conſtant action and tenſion of this muſcle, will be apt to render it daily wider; and we know from various hiſtories of wounds in this part, that they ſeldom arrive at any magnitude, without admitting a portion of the ſtomach, of the colon, or ſome other part of the bowels, to paſs from the abdomen into the thorax; by which the moſt violent pain is produced, together with ſome of the other ſymptoms which uſually accompany a ſtrangulated gut in caſes of hernia: In ſuch circumſtances, a ſtrangulated gut is much more dangerous than a hernia in its more ordinary form; for even although we ſhould be able to remove the ſtricture, by making an inciſion into the cavity of the abdomen, as the paſſage into the thorax would ſtill remain pervious, a return of the ſtrangulation might very ſoon be expected.

Wounds in the mediaſtinum require no peculiarity of treatment. The circumſtances which we have moſt cauſe to dread are, a lodgement of blood in one or both cavities of the cheſt, inflammation and ſuppuration, with its uſual conſequences. But the obſervations we have already made, reſpecting the management of penetrating wounds in other parts of the cheſt, apply with equal propriety to theſe; ſo that we need not at preſent enlarge upon them.

Nor is it neceſſary to enter minutely on the conſideration of wounds in the pericardium. As this bag contains a fluid which we ſuppoſe to be neceſſary for the eaſy motion of the heart, wounds in it may prove dangerous, from their tendency to prevent this fluid from being collected, as well as from their allowing it to ſpread through the cavity of the cheſt. It appears, however, from various obſervations, that wounds in it do not prove ſo hazardous as might at firſt be expected. They require the ſame general method of treatment with penetrating wounds of the thorax, which we have already conſidered.

In every variety of penetrating wounds of the thorax, where the cure is not accompliſhed without the formation of matter, they are apt to heal ſlowly; and in ſome caſes, eſpecially where abſceſſes have formed, a ſtillicidium of matter will continue for many years; nay, in ſome caſes, for life, notwithſtanding all our endeavours to prevent it. As this is an inconveniency which patients are at all times anxious to be free from, practitioners become neceſſarily much intereſted in the method of treating it: and, with a view to leſſen the diſcharge, and even to heal the ſore through its whole extent, aſtringent, and what are uſually termed Vulnerary Injections, have been adviſed. But although I have known them frequently employed even by ſurgeons of reputation, and under the beſt and moſt cautious management, I have ſeldom ſeen them uſed without ſome miſchief accruing from them; and I do not recollect a ſingle inſtance of their being productive of any advantage. They are apt to irritate and inflame the lungs and contiguous parts; and, inſtead of healing the ſore or abſceſs, they are apt to extend it, by tearing open the ſurrounding cellular ſubſtance.

For this reaſon, in wounds penetrating the thorax, I do not heſitate to ſay, that injections ſhould be laid entirely aſide: and, however diſagreeable a tedious diſcharge in this ſituation may prove, that we ſhould truſt entirely to the means we have already adviſed for preventing the matter from lodging, by preſerving as free and depending an opening as the nature of the caſe will admit.

SECTION XII.

Of Wounds of the Abdomen.

§ 1. *Anatomical Deſcription of the Abdomen and Parts contained in it.*

THE Abdomen, or lower belly, is the largeſt cavity in the body; above, it is bounded by the diaphragm, which divides it from the thorax; behind, it is ſupported by the vertebræ; the upper part of both ſides is covered by the inferior ribs; the reſt of it is all bounded by the abdominal muſcles, excepting the moſt depending part of it, which terminates in the pelvis; from the contents of which it is only ſeparated by the pæritoneum; a firm extenſive membrane, which not only lines all the cavity, but affords a coat to all the viſcera contained within it, being reflected in a very ſingular manner over them.

Anatomiſts divide this cavity into different regions. The middle and upper part of it, reaching from the xiphoid cartilage to within a ſmall ſpace of the umbilicus, is termed the Epigaſtrium; the hypochondria are the ſpaces on each ſide of this; the umbilical region extends from three inches or ſo above the navel, to the ſame diſtance beneath it; and all the parts between this and the pubes are termed the Hypogaſtric region.

In the treatment of wounds in the abdomen, a minute acquaintance with the parts contained in it, and of their relative ſituations with reſpect to each other, and to the diviſions or regions which we have juſt deſcribed, is a point of the utmoſt importance. We ſhall here give a general deſcription of the different viſcera: a more particular knowledge of them is beſt acquired from diſſection.

The parts contained in the abdomen are, the ſtomach and inteſtines; the meſentery, omentum, liver, gall-bladder, and ducts; pancreas, receptaculum chyli, ſpleen, kidneys, ureters, and upper part of the urinary bladder; the aorta, vena-cava, and other large blood-veſſels and nerves.

The ſtomach is a large membranous bag, placed in the upper part of the abdomen immediately below the diaphragm: It ſtretches from the left hypochondrium, where the moſt capacious end of it is ſeated, obliquely acroſs the epigaſtrium, and terminates before it reaches the right hypochondrium. The ſtomach has two openings; one termed the Superior Orifice or Cardia, where the œſophagus terminates; and the other the Pylorus, or Inferior Orifice, where the duodenum, the firſt of the ſmall inteſtines, begins. The cardia lies nearly oppoſite to the eleventh vertebra of the back, the large extremity of the ſtomach ſtretching conſiderably to the left; and the pylorus lies ſomewhat lower, and nearly two inches to the right of the vertebræ. It is proper, however, to obſerve, that the ſituation of the ſtomach and of theſe two openings is conſiderably affected by the quantity of food contained in it: So that a wound of the ſtomach, when it is full, may be directly oppoſite to an external wound in the teguments, and yet be ſeveral inches lower when it is empty.

The inteſtines commence, as we have juſt obſerved, at the pylorus, and are continued by many turnings or convolutions to the anus. This canal is in different parts of it diſtinguiſhed by different names: The upper part of the canal is termed the Small Inteſtines; and the under part of it the Larger, from the diameter of the tube being larger in the one than in the other.

Even different parts of theſe great diviſions of the inteſtines have received different names: The upper part of the ſmall guts, extending about a foot in length from the pylorus, is termed the Duodenum: the next portion of the canal, from being commonly found empty, is termed the Jejunum. This, in an adult of full growth, is ſuppoſed in general to be about four feet and a half in length: it is chiefly ſituated in the umbilical region. All the under part of the ſmaller inteſtines is diſtinguiſhed by the name of Ileum, from its lying almoſt entirely within the cavity formed by the oſſa ilea on oppoſite ſides of the abdomen. After making ſeveral convolutions from one ſide to another, it at laſt terminates in the cæcum, the firſt of the great inteſtines ſituated under the right kidney. From the cæcum, which is a round ſhort ſac with a ſmall vermiform proceſs, the colon originates: This is the largeſt of all the inteſtines; and as it occupies a conſiderable part of the abdominal cavity, the courſe of it merits particular attention. After leaving the right kidney, to which it is attached, it riſes and paſſes under the liver ſo as to be in contact with the gall-bladder, by which it is tinged of a deep yellow: From this it is continued in the form of an arch over the duodenum to the under part of the ſtomach; and paſſing into the left hypochondrium, it is there attached to the ſpleen and to the left kidney. This curvature is termed the Great Arch of the Colon. It now runs downward and backward; and again turning up, ſo as to form the figure of S, it terminates at the top of the os ſacrum in the laſt of the great guts, termed the Rectum, from its running nearly in a ſtraight line till it terminates in the anus.

The inteſtines being very pliable, and of a great length, they have neceſſarily much freedom of motion; but as they would be apt to be entangled in each other, Nature has provided a thin membranous web, termed the Meſentery, which running along the courſe of the inteſtinal tube, ſerves to connect it with ſufficient firmneſs to the vertebræ. The meſentery is evidently a production of the peritonæum: In its duplicature there are a number of ſmall glands, which often become ſo enlarged by diſeaſe as to be felt outwardly through the abdominal muſcles; and it ſerves as a ſupport to the lacteals, blood-veſſels, and nerves of the inteſtines. The omentum is a fine thin membrane, which comes into view on laying open the muſcles of the abdomen and the peritonæum. In general, it does not paſs beneath the umbilicus: but in corpulent people, when it is much filled with fat, it ſometimes deſcends to the very bottom of the belly; and in caſes of hernia, it is frequently met with in the ſcrotum.

This membrane is evidently intended as a protection to the bowels; to afford them an additional warmth; and probably by the fat which it contains to lubricate their external ſurfaces, ſo as to admit of their playing with more freedom on each other.

The liver is a large glandular body, ſituated on the right ſide immediately under the diaphragm: It is divided into two lobes; one termed the Great and the other the Small Lobe. The great lobe lies in the right hypochondrium, which it fills almoſt entirely: it reſts on the right kidney, and covers a portion of the great arch of the colon: a conſiderable part of the ſmall lobe lies in the epigaſtrium; the reſt of it paſſes over the ſtomach towards the left hypochondrium.

The liver is of a very irregular figure; its outer ſurface is arched, correſponding to the figure and ſize of the arch of the diaphragm. On the other ſide, it is in ſome parts flat, and in others concave, according to the figure of the parts with which it is in contact. It is of a conſiderable ſize and thickneſs on the right ſide; but towards the left its thickneſs decreaſes ſo, that at laſt it terminates in a thin edge.

The liver is kept in its ſituation by ſeveral ligaments attached to the diaphragm and contiguous parts.

The gall-bladder is a pyriform bag, ſeated in the concave ſide of the liver. The bile, after being ſecreted by the liver, is lodged in this bag, from whence it is conveyed into the inteſtines thro' the ductus choledochus, which enters the duodenum by piercing its coats in an oblique direction, about five inches below the pylorus.

The pancreas is a conglomerate gland, lying in a tranſverſe direction between the liver and ſpleen, immediately under the ſtomach. The liquor ſecreted by this gland is carried into the duodenum by a ſmall duct, which in ſome caſes terminates in the gut itſelf, and in others, near to the extremity of the ductus choledochus.

The receptaculum chyli is a ſmall membranous bag, through which the chyle paſſes from the inteſtines to the left ſubclavian vein by means of the thoracic duct. This bag, or ſac, lies upon the firſt vertebra of the loins, a little to the right of the aorta.

The ſpleen is a large ſpongy body, ſeated in the left hypochondrium, between the ſtomach and the falſe ribs, under the diaphragm, and immediately above and contiguous to the left kidney.

In Chap. XI. ſect. II. we gave a deſcription of the kidneys, ureters, and bladder; ſo that at preſent we need not enter upon it. But, beſides the ſeveral viſcera which we have mentioned, the aorta, vena-cava, and the large blood-veſſels and nerves which ſupply the bowels, lie all within the abdominal cavity.

We may diſtinguiſh wounds of the abdomen in the ſame manner as we have done wounds of the thorax. They may either be confined to the common teguments and muſcles, or they may penetrate the cavity; or a penetrating wound may be complicated with wounds of one or more of the viſcera.

§ 2. *Of Wounds of the Teguments and Muſcles of the Abdomen.*

In one point of view, wounds of the teguments and muſcles of the abdomen do not merit more attention than ſimilar injuries in other parts of the body; but they become highly important from the contiguity of the abdominal viſcera, and from the danger of theſe being ultimately injured by the neglect or miſmanagement of the external wound.

Our firſt object is to diſcover, Whether a wound has penetrated the abdomen or not; and whether any of the viſcera are injured. When the wound is extenſive, and any portion of the viſcera protrudes, the nature of the injury is evident; but in ſmaller wounds where no part of the bowels appear, it is often difficult to judge whether they penetrate the abdomen or not. In general, however, this point may be determined by attention to the following circumſtances: By a proper examination with the fingers or probe, after putting the patient as nearly as poſſible into the poſture in which he received the wound; by the form and ſize of the inſtrument, the depth to which it run, and the direction it appeared to take; by the quantity of blood diſcharged at the wound being conſiderable or not; by the ſtate of the pulſe and other attending ſymptoms; and by the diſcharge of feces, bile, or any other of the abdominal ſecretions.

When the wound is of ſuch a ſize as to admit the finger, we may always determine with certainty whether it reaches the cavity of the abdomen or not; as in this caſe the finger will come into contact with the viſcera: but probes ſhould be uſed with much caution; and unleſs the inſtrument paſſes eaſily in, without force, in a direct line, and to ſuch a depth as to convince us that it has reached the cavity, little or no dependence ſhould be placed upon it: For the parts here are ſo ſoft, and of ſuch a yielding nature, that a probe with very little force will paſs among them almoſt in every direction to a conſiderable depth. It is ſcarcely neceſſary to obſerve, that it is particularly proper, in every inquiry of this kind, to put the patient as nearly as poſſible into that poſture in which he received the wound. And the looſe texture of the parts ſhould prevent us from uſing injections, as is frequently done with a view to determine this queſtion. In wounds of the thorax, where the parts are firmer and more intimately connected, injections may be uſed for this purpoſe more ſafely; but in the abdomen they are apt to ſpread among the muſcles and cellular ſubſtance, by which the teſt is rendered uncertain, at the ſame time that miſchief is apt to enſue from the pain and inflammation which are induced.

The depth to which the inſtrument has paſſed, or the direction which it took, cannot be often aſcertained; but when this information can be obtained, it will aſſiſt us in judging of the nature of the wound. By comparing the ſize of the external opening with the ſize of the inſtrument, we may be led to determine the depth to which it has paſſed.

When the quantity of blood diſcharged from a wound in the abdomen is conſiderable, we may conclude almoſt with certainty, that ſome of the large internal veſſels have been injured; for excepting the epigaſtric artery, which runs in the anterior part of the abdomen in the courſe of the rectus muſcle, none of the teguments or muſcles of theſe parts have arteries of ſuch a ſize as to afford much blood. It is proper, however to obſerve, that even the largeſt artery in the abdomen may be wounded without any blood being diſcharged externally; for if the outward opening be not conſiderable, and eſpecially if the wound runs in an oblique direction, the blood, inſtead of being evacuated at the opening, will be extravaſated into the cavity of the belly, where large quantities of it may be collected, even without any remarkable degree of tenſion taking place.

In ſuch caſes, however, we are ſoon led to ſuſpect what has happened by the ſymptoms which enſue. The patient complains of debility and faintneſs; his pulſe becomes low; he is ſeized with cold ſweats; and if the diſcharge of blood be not ſtopped, every other ſymptom of approaching death ſoon make their appearance.

It ſometimes happens again that we are at once rendered certain that a wound has penetrated the cavity of the abdomen, by the diſcharge of feces; of bile; of the pancreatic juice, or even of chyle: and in ſome caſes, the ſame certainty is obtained by large quantities of blood being thrown up from the ſtomach or diſcharged by the rectum. Urine may be diſcharged by a wound which does not penetrate the belly; for the kidneys and ureters may with propriety be ſaid to lie behind the peritonæum, as well as a conſiderable portion of the bladder; but they are in general to be treated in the ſame manner with penetrating wounds in the abdomen.

When, again, none of theſe ſymptoms take place; when neither the finger nor probe can be eaſily introduced; when there is no diſcharge from the wound that leads to ſuſpect the viſcera to be wounded; when the pulſe remains natural; and when the pain is moderate; there will be much cauſe to hope that it has not paſſed to a greater depth than the common teguments or muſcles.

In the treatment of theſe wounds, we are to be entirely directed by the depth to which they penetrate, and by the ſymptoms which take place.

When it is diſcovered that a wound in the abdomen does not run deeper than the common teguments or muſcles, if none of theſe parts have been removed, we will ſeldom meet with any ſymptoms of importance, at leaſt where the habit of body is good, except where they are the conſequence of neglect or miſmanagement. Our views here ſhould be nearly the ſame with what we have adviſed in wounds of the thorax. The principal object is to prevent inflammation and the lodgment of matter: which is done by blood-letting; a low diet; the uſe of laxatives; reſt of body; and proper attention to the wound. But for a more particular detail of the proper treatment of ſuch a wound, we ſhall refer to the laſt ſection.

It is proper, however, to remark, that wounds in the boundaries of the abdomen, in one circumſtance, differ materially from ſimilar injuries of the thorax. As the muſcles and other ſoft parts of the cheſt are every where ſupported by bone, the lungs and other viſcera contained in the breaſt do not readily puſh out at the wound; but as the coverings of the abdomen are of a ſoft yielding nature, having anteriorly no bone to ſupport them, and many of the contained parts having no very cloſe attachments, they are apt to puſh forward and protrude wherever any unuſual degree of weakneſs occurs. In all wounds therefore of the abdomen, even where they do not penetrate, ſome caution is neceſſary from this conſideration alone; and more eſpecially ſo when any portion of the teguments or muſcles has been removed. The patient ſhould be kept as much as poſſible in a horizontal poſture during the whole cure: and when he attempts to ſit or walk, the weakened parts ſhould be ſupported by a proper compreſs, and a firm, ſomewhat elaſtic, bandage of flannel paſſed two or three times round the body; a caution which ought to be perſiſted in for a conſiderable time after the cure of the ſore is completed. By want of attention to this point, very troubleſome caſes of herniæ have occurred, which with eaſe might have been prevented.

§ 3. *Of Wounds which penetrate the Cavity of the Abdomen, but which do not injure any of the contained parts.*

Although an inſtrument may have penetrated to a conſiderable depth, we have much reaſon to hope that none of the viſcera are wounded, as long as the abdomen remains free from much pain and tenſion, the pulſe ſoft, and the ſkin of a natural heat: But even in this ſtate of ſuch a wound, we are not to conclude that there is no hazard; for it often happens, that wounds in theſe parts, which at firſt exhibit no appearance of danger, at laſt terminate fatally.

It is proper however to obſerve, that this may often be traced as an effect of improper management, and that practitioners have it frequently in their power to prevent it: For although ſome inſtances will occur of wounds of this kind ending fatally, where no ſymptoms appeared of the viſcera being wounded, and where after death no immediate injury was found to be done to them, yet this will not uſually happen in ſuch wounds that are properly treated from the firſt.

The danger which occurs here ariſes chiefly from two cauſes: from the acceſs of air to the cavity of the abdomen, by which the different viſcera are apt to become inflamed; and from the ſubſequent formation of matter, which, not finding an opening, will neceſſarily collect within the peritoneum.

In every wound therefore of this kind, after ſecuring any blood-veſſel of the teguments or muſcles that may have been cut, and which we ſhould always do by ligature immediately on its being diſcovered, our next object ſhould be to prevent, with as much certainty as poſſible, all manner of acceſs to the air. In ſmall wounds of theſe parts, this will be done with moſt eaſe and certainty merely by the lips of the cut being drawn together, and ſecured with ſeveral plies of adheſive plaſter: and as a farther ſecurity, a compreſs and flannel roller, ſuch as we have mentioned above, may be put over the whole: The ſame precautions with reſpect to blood-letting; a ſtrict antiphlogiſtic regimen, and reſt of body, which we recommended in more ſuperficial wounds of the abdomen, ſhould be here carefully obſerved where the danger is more conſiderable.

By this management theſe wounds, when ſmall, will often heal by the firſt intention; but when they continue open for ſome time, they ſhould be dreſſed as ſeldom as poſſible, and the dreſſing ſhould be renewed with as much expedition as the nature of the caſe will admit, ſo that the unneceſſary admiſſion of air may be avoided as much as poſſible.

It will ſometimes happen, however, even that the moſt exact attention will not prevent the acceſſion of bad ſymptoms: At firſt they will moſt readily be of the inflammatory kind, which will be removed by farther evacuations of blood and attention to the other circumſtances we have enumerated; or they will prove fatal, by ending in mortification; or they may terminate, as we have mentioned above, in the formation of matter. It is this laſt occurrence which we have now to advert to.

In ſuch circumſtances, we would adviſe an opening to be made in any other part of the body immediately for the diſcharge of the matter: But in theſe depoſitions in the abdomen, we can never diſcover with certainty, whether any collection has taken place or not, till it has continued for a conſiderable time: for the matter here lies ſo deep, that a ſmall quantity cannot be diſtinguiſhed; nor would it be proper for the diſcharge of a ſmall quantity of matter to incur that danger which always attends the free admiſſion of air to the abdomen;

and in ſmall collections this could not be avoided, as there would be a neceſſity of opening them in a ſlow gradual manner with a ſcalpel, as in ſuch caſes the trocar could not be plunged in without much riſk of hurting the viſcera. Inſtead of ſuch an attempt, therefore, we ſhould do nothing as long as the quantity of matter continues moderate, and while no bad ſymptoms have yet taken place. Indeed this is a good general rule in all wounds of the abdomen, never to inquire with much anxiety either for collections of matter, or for ſuch parts as from the nature of the wound there might be cauſe to ſuſpect ſhould be injured, till the appearance of ſymptoms renders it probable that the one or the other has taken place: for by much handling we often do miſchief; while frequently no danger enſues from wounds which at firſt were attended with very alarming ſymptoms. Nay we know, that in different inſtances a perſon has been run through the body with a ſmall ſword without any of the viſcera being injured, and the patient has done well without any bad ſymptom taking place. And we likewiſe know, that violent inflammation will ſometimes terminate favourably without the formation of matter; and even when matter is formed, that it will ſometimes be carried off by abſorption, ſo as to leave no veſtige of its having ever exiſted. It is the actual preſence therefore of bad ſymptoms produced by ſuch collections of matter, or the quantity of matter becoming ſo conſiderable as to prove inconvenient to the patient, that ſhould indicate the propriety of making an opening for diſcharging it: But as ſoon as we find this to be the caſe, we ſhould not heſitate; and whenever there is ſuch a quantity collected as to admit of the trocar being employed, we may draw it off with eaſe and ſafety: For by inſerting the inſtrument in an oblique direction, no air will be admitted; by which the only riſk which attends this opetion will be avoided. I have been the more particular upon this ſubject, from having obſerved two caſes of this kind terminate fatally where there was not previouſly any appearance of danger. As it was evident in both caſes that matter was collected, it was determined to diſcharge it; and as it was ſuppoſed to be ſeated either in a particular cyſt, or in the ſubſtance of the muſcles, and not in the cavity of the abdomen, it was done by making a ſmall opening into it with a ſcalpel. But in both, the moſt violent ſymptoms of inflammation occurred in the courſe of the firſt two days; and the patients ſoon died. And I conclude that it was by the free admiſſion of air to the cavity of the abdomen that theſe ſymptoms were induced: for after death the matter was found to be lodged in that cavity; and I have ſince that time, in two ſimilar caſes, drawn large quantities of purulent matter off with a trocar, where it was evidently ſeated in the abdomen, without any bad conſequences enſuing.

In drawing off matter from the abdomen, the ſame precautions are neceſſary in doing it that are now ſo univerſally admitted in diſcharging ſerum by the uſual operation of the paracenteſis. But as we gave a particular account of this in Volume II. Chapter XXI. we muſt now refer to what was then ſaid upon it.

Penetrating wounds of the abdomen may prove dangerous from another cauſe. Conſiderable portions of the bowels are ſometimes protruded, without any other injury being done to them; and this may be productive of fatal conſequences.

The moſt certain method of preventing danger in every caſe of this kind, is to return the protruded parts as quickly into the belly as can be done with propriety. Almoſt every writer upon this ſubject deſires us in the firſt place to foment them with warm emollient decoctions, or to cover them for ſome time with the web or omentum of ſome new-killed animal: but they do not recollect, that during the time loſt in making theſe preparations,

rations, the protruded parts will probably ſuffer more than can be gained by the application of them; and that the moſt natural, as well as the moſt proper fomentation for them, is the heat and moiſture of the patient's belly. In recommending theſe applications, it is ſaid, that they not only remove the dry parched ſtate of the parts which expoſure to the air is apt to induce; but by means of them we are enabled to judge with more certainty whether or not they are in a ſtate that admits of their being returned with ſafety: for it is alleged, even by ſome writers of reputation, that parts which are apparently in a ſtate of incipient gangrene, and which otherwiſe we might be afraid of puſhing into the abdomen, may, by a proper uſe of theſe fomentations, be ſo far recovered as to render it highly proper to return them.

But although this opinion has been very generally received, and the practice followed which it inculcates, it appears to me to be ſo fraught with impropriety

propriety and danger, that I cannot paſs it over without mentioning in the ſtrongeſt manner the idea I entertain of it. Much miſchief may be produced by it, and I ſee no advantage that can accrue from it.

By many it is ſaid, that no part of the inteſtines ſhould be returned into the abdomen that have once acquired any tendency to gangrene, on account of the riſk of the feces burſting into the belly, by which the patient would neceſſarily die. Wherever there is a certainty of ſuch an occurrence, by the parts being actually in a ſtate of gangrene, to return them to the abdomen would no doubt be highly improper, as it would be depriving the patient of the only chance which he can have of a recovery, that of ſecuring the ends of the ſound parts of the gut at the mouth of the wound, by which there may be ſome poſſibility of their uniting afterwards, as has happened in different inſtances; and by which he will at leaſt be certain of having at all times a free diſcharge for the feces. But although in this ſituation the practice we allude to is to be conſidered as highly proper, yet when gangrene has not actually taken place, as there will ſtill be ſome cauſe to hope that the natural heat of the belly may prevent it, the parts ſhould be inſtantly returned.

When parts protruded from the abdomen are covered with ſand, duſt, or any other extraneous matter, it will no doubt be proper to clear them of it before they are replaced; and with this view, bathing them in warm milk, or in milk and water, may anſwer better than any other method. But this is perhaps the only cauſe that can render the practice neceſſary.

Some addreſs is neceſſary in returning any part of the inteſtines which have been protruded in the eaſieſt manner. The patient ſhould be put into that poſture which will moſt effectually relax the parts in which the wound is ſeated, with his head and cheſt ſomewhat lower than the abdomen and buttocks, ſo that the weight of the bowels may have ſome effect in dragging in the protruded parts. When in this ſituation, the ſurgeon having his fingers dipped in warm oil, or covered with ſoft oiled linen, ſhould endeavour to replace the parts by beginning his preſſure at one of the ends of the gut, and continuing it along the doubling or curvature to the other. In this manner any portion of the bowels will be eaſily replaced without any farther enlargement of the wound, when the opening is not very ſmall: And when any part of the omentum, or any others of the viſcera, are protruded, there will be ſtill leſs difficulty in returning them. But conſiderable parts of the inteſtines are frequently puſhed out at ſuch ſmall punctures, that they cannot be returned but with much more preſſure than ſhould ever be applied to them. In this caſe, our object will be more eaſily accompliſhed, and with leſs hazard to the patient,

tient, by enlarging the opening, than by the application of ſo much force as is generally required in puſhing any conſiderable portion of gut through a ſmall aperture. Some dexterity, however, is neceſſary in enlarging an opening in this ſituation. When the aperture is of ſuch a ſize as to admit the finger of the ſurgeon, it may be done with eaſe and ſafety: but in ſome caſes it is ſo completely filled with the parts which paſs thro' it, that this is impracticable. In this ſituation, we are adviſed by authors to inſert a director between the bowels and the parts to be divided, and to enlarge the opening by cutting upon it either with a ſcalpel or biſtoury. This, however, muſt be attended with much hazard; for we can never diſtinguiſh with certainty whether ſome plies of the bowels be elevated by the director or not, as this will ſometimes happen notwithſtanding all our care to prevent it. Inſtead of following this method, I have in different caſes enlarged the opening, by making an inciſion through the integuments and muſcles with a ſcalpel, in the ſame gradual manner that we operate in caſes of hernia; taking care, as ſoon as the peritoneum is laid bare, to introduce the end of a probe-pointed biſtoury between it and the gut, and dividing it as far as may be neceſſary, which now may be done with entire ſafety. If in this manner the opening be enlarged ſo as to receive the point of the finger, it may afterwards be increaſed at pleaſure, by inſerting the finger ſo as to act as a conductor for a biſtoury or ſcalpel: But till it can be done in this way, no cutting inſtrument ſhould ever be paſſed into the abdomen; for although much ingenuity has been ſhown in the invention of inſtruments with wings to protect the bowels in this part of the operation, yet none of them anſwer any other purpoſe than to render the buſineſs more complex.

In enlarging a wound in this ſituation, it ſhould be done as much as poſſible in the direction of the muſcular fibres of the parts; and, for an obvious reaſon, the inciſion ſhould commence at the bottom of the wound, and be carried downwards, and not at the top.

We may thus enlarge the opening to any neceſſary extent, always taking care not to make it larger than the nature of the caſe may require. And this being accompliſhed, the protruded parts ſhould be replaced with as much expedition as poſſible in the manner we have adviſed. In returning bowels to the abdomen, it has ſometimes happened, through confuſion or miſtake in the operator, that they have been puſhed in between the layers of the abdominal muſcles. This ſhould be guarded againſt with the utmoſt attention; for when left in this ſituation, the patient will be nearly in the ſame danger as at firſt. Indeed this will be the caſe if they be not placed altogether within the peritonæum.

The accident we allude to may happen in any part of the belly, when a ſurgeon is not ſufficiently accurate and attentive: but it is moſt likely to occur in wounds that paſs through either of the recti muſcles, owing to the ſheaths of theſe muſcles being particularly looſe and flaccid; and it will more readily happen in corpulent people than in others, owing to the great depth of fat and cellular ſubſtance which, in ſubjects of this deſcription, lie above and between the different muſcles of the abdomen.

Inſtead of enlarging the opening in the abdomen, it has been propoſed to diſcharge the air contained in the protruded portion of the bowels by making holes in it with a needle, by which the bulk of it may be ſo much diminiſhed as to admit of its being eaſily replaced at the ſame opening. As this has been mentioned by writers of experience, I think it right to ſpeak of it; but it is chiefly with a view to caution the younger part of the profeſſion againſt it. It may indeed be done with more eaſe to the operator; but this appears to be the only argument in its favour: For although ſome may have recovered on whom it has been practiſed, yet ſurely the ſmalleſt opening made into the gut muſt be attended with much more danger than can probably ariſe from the external opening in the teguments and muſcles being ſomewhat enlarged. And beſides, in reducing protruded bowels, however diſtended they may be with air, we may often render them perfectly flaccid by preſſing the air contained in them into that part which remains in the abdomen. And if this be cautiouſly done, it may at all times be attempted with ſafety. Indeed no trial ſhould ever be made for the reduction of a portion of inteſtine that is much inflated, till we have endeavoured in this manner to reduce the ſize of it.

After the bowels are replaced, our next object is to preſerve them in their ſituation till the wound is ſo firmly conſolidated as to prevent them from falling out. When the opening is ſmall, this may be effectually done by laying the patient in a proper poſture, with his head and buttocks elevated; by preventing coſtiveneſs; and by a firm roller of flannel paſſed ſeveral times round the body, ſo as to ſupport the injured parts till they are united. But in extenſive wounds of the abdomen, it is found, even when they are treated with every poſſible attention, that it is difficult, and in ſome caſes impoſſible, to prevent the bowels from prolapſing by the ordinary dreſſings and bandages. In ſuch caſes, we are under the neceſſity of drawing the ſides of the wound together by ſutures; an operation commonly termed Gaſtroraphy.

Various methods have been propoſed for making this ſuture; but the common interrupted ſuture, or the quilled ſuture, which is merely a variety of the other, anſwers the purpoſe better than any of them. Much care and attention, however, is neceſſary in paſſing it, particularly in avoiding the bowels, which every where lie contiguous to the parts to be united.

The ſurgeon being provided with a number of broad flat ligatures, ſufficient for the extent of the wound, and of a ſtrength that will retain the parts together, each ligature ſhould be armed with two large curved needles, one towards each end; and the patient being laid in a poſture that is moſt eaſy for himſelf, at the ſame time that it relaxes the injured parts moſt effectually, the ſurgeon ſhould now inſert the fore-finger of his left hand into the wound, and being ſure that it is in contact with the peritonæum, without any of the bowels lying between them, he ſhould now paſs the point of one of the needles along his finger to the diſtance of an inch at leaſt from the edge of the wound; and having ſecured the other end of it with the thumb and palm of his hand, he muſt now puſh it outward, ſo as to make it pierce the ſkin at a ſimilar diſtance from the external wound in the teguments. In this he will be much aſſiſted by preſſing the muſcles and ſkin down upon the needle with his right hand: and one of the needles being paſſed, the other muſt in like manner be puſhed through the oppoſite ſide of the wound, by carrying it alſo from within outward. It might indeed be done by entering the needle outwardly, and carrying it in upon the finger: but we could not in this manner avoid the bowels with ſuch certainty; a point of the utmoſt importance, and requiring the niceſt attention.

The firſt needles ſhould be paſſed within half an inch of the upper part of the opening; and the others ſhould be continued to within an equal diſtance of the bottom, at the diſtance of three quarters of an inch from each other; for as the retraction of parts divided in this manner is more to be dreaded than any other occurrence, it ought in a particular manner to be guarded againſt. The ligatures being all inſerted, the parts ſhould now be ſupported by an aſſiſtant; and a proper knot being tied upon each of them, the whole extent of the wound ſhould be covered with a pledgit of lint ſpread with any unctuous ſubſtance, for preventing acceſs to the air. After this, the parts ſhould be ſupported with a roller: The patient ſhould now be put to bed, and ſhould be treated in the manner we have directed above, with blood-letting, and a low regimen, in proportion to the violence of the ſymptoms which ſupervene.

In performing this operation, I have ſaid that the ligatures ſhould be continued to within half an inch of the bottom of the wound; which is contrary to the uſual practice. In general an opening is left beneath, with a view to diſcharge any matter that may form in the courſe of the cure; but there is no ſufficient reaſon for doing ſo. Inſtead of proving ſerviceable, it is probable that it muſt often do harm, by giving free acceſs to the air, which in every wound of the abdomen ſhould be particularly guarded againſt. The opening could not be preſerved without the aſſiſtance of a tent, by which much irritation and pain might be induced: nor would it ever anſwer the purpoſe of diſcharging the matter, excepting it be accidentally ſituated near to the under part of the abdomen. I am clear, therefore, that the whole extent of the wound ſhould be treated in the ſame manner; and if matter ſhould afterwards form, that it will be better to truſt to its being abſorbed, or even evacuated by the trocar in the manner we have already mentioned, than to truſt to this precarious method of treatment.

When any practitioner prefers what is uſually termed the Quilled Suture, the one we have deſcribed may be eaſily converted into it, by introducing each of the ligatures double. After all the ligatures are paſſed, a ſmall roll of plaſter, or a piece of a large bougie, ſhould be paſſed through the different loops, which ought all to be on one ſide of the wound; and a ſimilar roll being placed on the oppoſite ſide between each of the ligatures, they muſt now be tied upon it with running or bow knots, of ſuch a tightneſs as may appear to be neceſſary; care being taken during this part of the operation to have the ſides of the wound properly ſupported by an aſſiſtant.

If the parts are properly and equally drawn together, we will ſeldom find it neceſſary to remove the ligatures till the parts are united; which they will always be in ſix or ſeven days, if they have been kept in cloſe contact, and if no unuſual cauſe has occurred to prevent it. But when the ligatures give much pain, and eſpecially when the patient complains of much tenſion over the abdomen, the knots ſhould always be untied and kept perfectly looſe, till by blood-letting, fomentations, and gentle laxatives, theſe ſymptoms are removed, when the parts may be again drawn together and ſecured as before.

We have hitherto been ſuppoſing that the protruded part conſiſts of a portion of the alimentary canal only, this being the part which in wounds of the abdomen is moſt frequently puſhed out: but it is proper to remark, that the other viſcera are alſo liable to be protruded, particularly the ſtomach and omentum. This, however, does not vary the method of treatment, which ought to be nearly the ſame whichever of the viſcera be puſhed out. The parts ſhould in every inſtance be replaced as quickly as poſſible, and retained in the manner we have already pointed out.

We are now to conſider the treatment of thoſe wounds in the abdomen which are attended with injuries done to one or other of the viſcera. And in the firſt place, wounds of the alimentary canal require our attention, as being moſt frequent.

§ 4. *Of Wounds of the Alimentary Canal.*

In a former part of this ſection we have obſerved, that wounds of the inteſtines may be diſcovered by the diſcharge of blood from the mouth and by the anus, as well as by the diſcharge of feces from the wound in the teguments: We likewiſe judge of this point by the diſcharge of fetid air from the wound, and from the depth and direction in which the inſtrument appeared to run.

By attending to theſe circumſtances, and to the ſymptoms with which wounds in the inteſtines are commonly attended, ſuch as nauſea, ſickneſs, violent gripes, or pains through the abdomen, cold ſweats, and faintings, we may in general determine with much certainty whether they are injured or not. But unleſs the wounded part be brought into view, little or no advantage is gained by the diſcovery: for while it remains undiſcovered, our method of treatment muſt be nearly what we have recommended for wounds which merely penetrate the cavity. Authors indeed direct us to ſearch for the wounded part of the gut: But as the danger from the extent of the wound, which in in this caſe would be requiſite, as well as from the expoſure of the contents of the abdomen, would probably be greater than from allowing the wounded part to remain, this attempt ought never to be made; the more eſpecially as we know that wounds in the inteſtines have been healed, although the injured part has not been diſcovered.

When we find, however, that a wound is inflicted on a portion of protruded gut, we ought by no means to replace it till we endeavour to prevent its contents from being effuſed into the cavity of the abdomen; which can only be done by ſewing up the opening.

There are different methods propoſed for ſecuring openings of this kind. Le

Dran thinks that it may be done with moſt ſafety by what he terms the Looped Suture; while the generality of practitioners effect it by the Glover's Suture. The looped ſuture is performed in the following manner: One end of the wound is to be held by an aſſiſtant, while the ſurgeon does the ſame with the other; and the needles, which ſhould be round, ſtraight, and ſmall, carrying each of them a thread a foot long, muſt be equal to the number of ſtitches intended to be made. As many of the ligatures are now to be paſſed through both lips of the wound as appear to be neceſſary, taking care that they are nearly a quarter of an inch diſtant from each other. The threads being all paſſed, and the needles removed, all thoſe on one ſide of the cut muſt be tied together with a knot at their ends, and thoſe on the oppoſite ſide muſt afterwards be ſecured in the ſame manner. They are now to be joined together, and to be twiſted two or three times round, ſo as to form a kind of a cord: By this means the divided parts of the inteſtine are puckered together, ſo that the ſtitches, which before were diſtant about a quarter of an inch, are now brought cloſe to each other. The ſuture being thus finiſhed, an aſſiſtant muſt hold the two ends of the twiſted threads, whilſt the ſurgeon replaces the inteſtine in the manner we have already directed. The threads are to be ſecured to the bandage, which is put over the dreſſings; and after remaining till the wound in the gut may be ſuppoſed to be healed, they are to be untwiſted; and one ſide of each of them being cut off cloſe to the external wound, they muſt now be drawn cautiouſly and ſeparately away.

The principal objection to this method of ſtitching theſe wounds is, that in ſome degree it muſt contract the diameter of the gut, by which dangerous obſtructions might afterwards be produced. Inſtead of it the Glover's Suture, as it is termed, is commonly practiſed.

In making this ſuture, a ſmall, fine, round needle ſhould be uſed, armed with a thread of ſilk. The ſurgeon laying the lips of the wound exactly together, muſt perforate both at the ſame time; and carrying the needle to the ſame ſide at at which it entered, he muſt now make a ſecond ſtitch at a ſmall diſtance, perhaps at the eighth part of an inch from the firſt; and in the ſame manner muſt continue, by a proper number of ſtitches, to draw the whole extent of the wound together. This being done, a ſufficient length of the thread is to be left out at the external wound, for the purpoſe of drawing it away when we ſuppoſe the wound in the gut may be united.

Even this method of treatment, however, muſt evidently tend to leſſen the diameter of the gut; and I think the operation may be performed with the ſame degree of ſecurity, and in a manner that will obviate this difficulty, by entering the needle always from the inſide of the gut, and puſhing it outward. The operation ſhould commence near to one end of the wound: the needle being puſhed through one ſide of the gut, the ligature ſhould be drawn forward and retained by a knot formed on the end remaining in the inſide. The needle muſt now be carried ſtraight acroſs and entered in a ſimilar manner, ſo as to pierce the oppoſite ſide of the wound alſo from within; but the following and every ſucceeding ſtitch will not be oppoſite to each other. When the operation is rightly performed, the needle will be carried from one ſide of the wound in a diagonal line to the other, and will enter the gut at the diſtance of two-tenths of an inch from the point which it came from on the oppoſite ſide. In this manner the ſides of the wound may be drawn cloſely and exactly together, without leſſening the diameter of the gut in any degree; and the end of the ligature may at laſt be ſecured and cut off cloſe to the other extremity of the wound, if the gut is to be put freely into the abdomen; or it may be left of a ſufficient length to hang out at the wound in the teguments, if it is the meaning of the operator to retain the wounded part of the inteſtine in contact with the external opening. This indeed is uſually done, that we may have it in our power, as it is ſaid, to draw away the ligature on the wound of the gut being cured. It is probable, however, whatever ſuture may be employed, if more than one or two ſtitches have been paſſed, that it will be very difficult, and even uncertain, our getting the ligature away, without hurting the inteſtines more than we ought to do. I would never adviſe, therefore, with any view of this kind, that the ligature ſhould be left out at the wound; leſs danger will ariſe from cutting it entirely away, and allowing the ſtitches to remain: a conſiderable part of it will fall into the cavity of the gut; and in ſuch circumſtances the danger of the patient from other cauſes is ſo great, that any additional riſk that can occur from the remaining part of it, muſt be ſo trifling as not to deſerve notice. But in extenſive wounds of the inteſtines, where there may be much cauſe to fear that the operation will not prove ſucceſsful, with a view to prevent the feces from being emptied into the abdomen, it may be proper, by means of the thread uſed for the ligature, to retain the injured part in contact with the wound in the peritonæum. But of this we ſhall preſently ſpeak more particularly.

This is the method of treatment which we would adviſe when the gut is not cut entirely acroſs; and, however ſmall a wound of the inteſtines may be, it ought always to be ſecured with a ligature: for although it is alleged by ſome authors, that we ſhould rather truſt to nature for the cure of a ſmall opening here than to inſert a ligature; to me it appears that their opinion is by no means well founded; inſomuch that I would not leave even the ſmalleſt opening that could admit either feces or chyle to paſs without ſtitching it up. But where any part of the alimentary tube is cut completely through, ſome difference will be neceſſary in the method of management.

When both ends of the divided gut protrude at the wound, it ought to be our object to bring them into contact in ſuch a manner as to admit of their uniting. There are different modes of effecting this. It has been done by ſtitching the two ends of the gut to the peritonæum and abdominal muſcles, exactly oppoſite and contiguous to each other; and although the feces muſt in this manner be evacuated for ſome time by the wound, yet different inſtances have occurred of the two ends of the gut adhering firmly together, and being completely united in the courſe of a very ſhort time: Of this two caſes have fallen within my own obſervation.

In ſuch circumſtances, we are commonly adviſed to plug up the opening in the end of the upper extremity of the gut, not only with a view to keep the patient clean and comfortable, by preventing the feces from being at all times puſhed out, but to prevent, as we are told, the gut from contracting and from being diminiſhed in its diameter. I am convinced from experience, however, that this precaution is very unneceſſary; and I know that it proves hurtful. Inſtead of introducing tents or doſſils of any kind, the outward ſore ſhould be dreſſed as lightly as poſſible; and if care be taken to keep the patient clean, the reſt ſhould be truſted entirely to nature.

This is, perhaps, the beſt method of managing this variety of wound; but the ſame intention may be anſwered by inſerting the upper extremity of the divided gut into the end of the other, and ſtitching them together. In this ſituation it would be difficult to draw the divided parts together with a needle and ligature, without hurting the oppoſite ſides of the gut, in any other way than by keeping it extended by means of ſome round body inſerted into it. For this purpoſe it has been propoſed to make uſe of a tube of thin paſteboard or paper; but as this might be laid hold of and kept firm by the ligature, a ſmall roll of tallow is preferable, as it will afterwards melt and paſs eaſily off with the feces. A piece of it, nearly equal to the diameter of the inteſtine, ſhould be inſerted into the end of the upper portion of the gut; and being afterwards paſſed into the other, ſo as to carry the one, to the extent of an inch or thereby, fairly into the other, the two portions ſhould now be ſtitched together with a ſmall needle armed with a fine thread. The ſtitches ſhould be carried completely round the gut; and in order to give them as great a chance as poſſible of ſucceeding, they might even go twice round; firſt at the edge of the under portion of gut, and afterwards about an inch beneath, near to where the upper part of it terminates.

In the inſertion of one extremity of the gut within the other, we have deſired, for an obvious reaſon, that the end of the upper portion ſhould be put into the other; but it requires ſome attention to make the diſtinction. The periſtaltic motion will be obſerved to be more remarkable in the upper diviſion than in the under: But the moſt certain method of judging, is to obſerve at which of the ends the feces or chyle are evacuated. An inverſion of the uſual motion of the bowels might indeed produce a deception; but as this is not a common occurrence, we are not to ſuppoſe that at this particular time it is likely to happen.

In wounds of theſe parts, a portion of divided gut ſometimes hangs out at the wound, while the other end of it has ſlipped into the abdomen. In ſuch circumſtances, authors in general adviſe the end of the gut to be ſtitched to the peritonæum, and other parts contiguous to the wound. If it proves to be the upper part of the gut, the patient, it is ſaid, may live under the inconvenience of an artificial anus; and if it be not near to the upper part of the ſmaller inteſtines, that a ſufficient quantity of chyle may be carried into the blood for his ſupport and nouriſhment. But in the event of this proving to be the under part of the gut, although death would certainly enſue were we to reſt ſatisfied with this, it has ſcarcely been ſuppoſed that we ought to proceed farther.

I am clear, however, that this will not prove ſatisfactory to the feelings of any practitioner poſſeſſed of that degree of fortitude which our art requires, and who has that regard for the ſafety of his patient which every ſurgeon ought to poſſeſs. And although I have adviſed, in wounds of the inteſtines, when no part of them protrude, where we cannot therefore know whether the wound be large or only a ſmall puncture, and where the injured part may be ſo ſituated that it could not be reached without opening the greateſt part of the abdomen, and turning out perhaps the whole alimentary canal, that we had better allow the patient to have the chance of recovering without any attempt to make a diſcovery, and which he may do if the wound is ſmall, than to propoſe a meaſure, which of itſelf might be attended with more hazard than the injury for which it was meant to be a remedy. Yet, when we are rendered certain of the gut being completely divided by one end of it hanging out of the wound, as this will give much cauſe to imagine that the other is at no great diſtance, I think it ought by all means to be ſearched for, by enlarging the external wound ſo as to admit of the fingers of the operator being freely inſerted. Even where the upper part of the gut is protruded, it is worth while to ſubmit to this inquiry, merely in order to have at leaſt ſome chance of avoiding the loathſome inconvenience

venience of an artificial opening for the feces: And where the upper part of the gut has ſlipped in, the patient can have no chance for farther exiſtence if it be not diſcovered. In ſuch a ſituation, therefore, we ſhould not heſitate as to the meaſures.

In wounds of the abdomen, the inteſtines, beſides being protruded and wounded, are ſometimes mortified; and they are ſometimes mortified without being wounded. But whether mortification be combined with a wound or not, the method of treatment ſhould be nearly the ſame.

Where there is only a tendency to gangrene from the parts being much inflamed, they ſhould be returned immediately into the abdomen, for the reaſons we have given in a preceding part of this ſection. But whenever they are entirely mortified, the black dead ſpot will ſoon fall out; and the remainder being thus reduced nearly to the ſtate of a ſore from any other cauſe, the ſame method of cure will become applicable.

Authors, in general, have treated of wounds of the ſmall and great inteſtines ſeparately: but no neceſſity appears for this; they are nearly of the ſame nature, and require the ſame method of treatment. The ſmalleſt injury done to the bowels is always hazardous, and in every inſtance of it our prognoſis ſhould be doubtful. But it is ſaid, that wounds in the ſmaller inteſtines are more particularly dangerous than in the others; from their being more apt to induce violent degrees of inflammation: I have not obſerved, however, that this is confirmed by experience.

§ 5. *Of Wounds of the Stomach.*

In wounds of the abdomen, we conclude that the ſtomach is injured, from the part at which the inſtrument entered, and from the depth and direction in which it appeared to run; from the patient being ſeized with a vomiting of blood; from his complaining of a great and unuſual degree of ſickneſs; of languor and ſingultus; and from the food and drink being evacuated at the wound ſoon after they are ſwallowed.

All wounds in the upper part of the left hypochondrium which paſs to any conſiderable depth, as likewiſe thoſe of the epigaſtrium, will neceſſarily enter the ſtomach; but wounds of any part of the abdomen may reach it when they run in an oblique direction: And it ought to be noticed, as we have elſewhere obſerved, that wounds may penetrate this viſcus when it is full, which would not touch it when empty.

Wounds of the ſtomach muſt always be conſidered as dangerous, and a doubtful prognoſis only ſhould be given; for although there are many inſtances on record of their being cured, yet this is by no means ſo common as to warrant our expecting it.

The ſame plan of treatment which we

have adviſed in wounds of the inteſtines applies with equal propriety to wounds of the ſtomach. When the wounded portion protrudes, it ſhould be ſtitched up and replaced as quickly as poſſible. But even where it does not protrude, it ought to be ſearched for; and when the anterior part of the ſtomach only has ſuffered, it will not be difficult to diſcover it. We ſhould not, however, be deterred from the inquiry by the ſeat of the wound; for we may be able to reach it wherever it may be, excepting in the poſterior part of the ſtomach.

It is to be obſerved, that wounds of the ſtomach are more readily diſcovered than wounds of the inteſtines; for theſe laſt are more concealed by convolutions of themſelves, as well as by other viſcera.

In all wounds of the ſtomach and bowels, the patient ſhould be put upon as ſtrict a regimen as his ſtrength will bear; not only with a view to prevent the acceſſion of inflammation, which, as we have formerly obſerved, is the moſt dangerous ſymptom that can occur, but to prevent the injured parts from being diſtended, by which they might be very materially hurt. Inſtead of regular meals, a ſpoonful or two only ſhould be allowed at once; and no more given even in this way than is merely neceſſary to ſupport life. In wounds of the ſtomach and upper part of the ſmaller inteſtines, we might venture in a great meaſure, and at leaſt for ſeveral days together, to truſt to nouriſhing glyſters: but this ſhould be carefully avoided in wounds of the great guts; as the injected liquor might more readily be forced in this way into the cavity of the abdomen than if it had been taken by the mouth.

§ 6. *Of Wounds of the Omentum and Meſentery.*

We have already mentioned the ſituation of theſe parts. But we have no means of judging whether they have ſuffered by wounds of the abdomen or not, if they be not protruded.

When it is found that a protruded portion of omentum is injured, we ought to ſee whether any part of it be nearly ſeparated from the reſt or not: for whatever part of it is in this ſtate ſhould be immediately removed; or when it has become cold, with much reaſon to dread that it will mortify, it will likewiſe be proper to remove it. But when no appearance of this kind takes place, we ſhould adviſe it to be immediately returned into the abdomen.

In the Firſt Volume of this Work, we found it neceſſary to enter upon the conſideration of this ſubject when treating of Herniæ: It will therefore be proper to refer to what we had then occaſion to ſay upon it.

In wounds of the meſentery, what we have moſt to dread is the diſcharge of blood or chyle into the cavity of the abdomen; for as the lacteals, together with a great number of arteries and veins, run in the duplicature of this membrane, it can ſcarcely be injured without ſome of them ſuffering. Whenever any portion of it, therefore, is protruded, it ought to be examined with accuracy: and when any of its veſſels are found to be divided, they ſhould be immediately tied with ligatures; the ends of which being left out at the wound, will admit of their being taken away as ſoon as they are thoroughly ſeparated.

§ 7. *Of Wounds of the Liver and Gall-bladder.*

From the anatomical deſcription we have given of the contents of the abdomen, it appears that the liver will be very apt to be hurt by all wounds that penetrate either the right hypochondrium or epigaſtrium.

The liver does not appear to be poſſeſſed of much ſenſibility; for many inſtances have occurred where ſuperficial wounds in it have healed with the ſame eaſe, and have not induced any more alarming ſymptoms than what uſually occur from wounds of the ſame extent in any other part of the body. But wounds of this viſcus, which paſs to any conſiderable depth, are always to be conſidered as dangerous, from the great quantity of blood which is ſent to it, as well as from the interruption which they may give to the formation of bile, one of the moſt important ſecretions in the body: And they are apt to prove particularly hazardous, from their allowing the bile, which is very ſoon rendered putrid, to be poured into the cavity of the abdomen.

We judge of the liver being injured, from the ſituation and depth of a wound; from the quantity of blood that is diſcharged being more conſiderable than could probably be afforded by any blood-veſſels of the integuments or muſcles; from bile being diſcharged along with the blood; from bile tinged with blood being carried into the bowels, and diſcharged both by the ſtomach and anus; from the abdomen being apt to ſwell and become tenſe; and from pain being felt on the top of the ſhoulder, an uſual ſymptom in different affections of the liver.

All that we can do in wounds of this viſcus, is to guard as much as poſſible againſt exceſſive hemorrhagies, and to diſcharge any collections of blood or of bile that may form in the abdomen, when they become ſo conſiderable as to render it neceſſary. We endeavour to prevent or put a ſtop to the hemorrhagy by blood-letting, gentle laxatives, keeping the patient cool, and at perfect reſt both in body and mind. And we diſcharge collections of this kind, by making an opening in the moſt depending part of the abdomen, or wherever they may happen to form.

Wounds of the gall-bladder are by experience found to prove more dangerous than wounds of the liver; for they are ſtill more difficult to heal, at the ſame time that they are more certainly productive of extravaſation of bile into the abdomen. Inſtances indeed have happened of the bile being ſo completely obſtructed in its paſſage from the gall-bladder to the duodenum, that the bladder has ſwelled ſo as to produce much external tumefaction: And, in ſome caſes, theſe ſwellings, after burſting or being opened, have continued to diſcharge bile for a conſiderable time; and at laſt have been known to heal without producing any extravaſation into the abdomen, or any other alarming ſymptom. This, however, proceeds from the previous diſtention of the bladder having produced an adheſion between it and the neighbouring parts; by which, when an opening is made into it, the bile is prevented from ſpreading. But few inſtances have occurred of wounds in this viſcus having a favourable termination. To procure as free a vent for the bile as poſſible, and to diſcharge it by an opening ſuch as we have mentioned, when it collects in the abdomen, is perhaps all that we ought to attempt.

§ 8. *Of Wounds of the Spleen, Pancreas, and Receptaculum Chyli.*

When the ſpleen is laid bare, we eaſily diſcover whether it be injured or not: but as it does not afford any particular ſecretions by the appearance of which we might be determined, and as wounds of it do not excite any remarkable ſet of ſymptoms, it is difficult to judge merely from the depth or direction of a wound whether it be hurt or not. It is obſerved indeed, that the blood diſcharged immediately from the ſpleen is of a peculiar deep red colour; but this teſt is not to be depended on: Nor are we to conclude from the quantity of blood being conſiderable which a wound in the region of the ſpleen may diſcharge, that this viſcus is certainly injured; for it lies ſo near to large blood-veſſels belonging to other viſcera, particularly to the emulgent arteries and veins, that no certain judgment can be formed from this circumſtance.

The ſame obſervations which we have made upon wounds of the liver will apply with propriety to wounds of the ſpleen; only we may ſuppoſe, that the danger attending the latter will not be ſo conſiderable, as no material ſecretion will be interrupted by them.

As the pancreas lies deeply covered with the other viſcera, wounds of it can ſeldom be diſcovered: But as a diviſion of the duct of this gland will prevent the ſecretion which it affords from being carried to the bowels, this may, by interrupting or impeding digeſtion, do much injury to the conſtitution; and as the liquor will be effuſed into the cavity of the abdomen, it may thus be productive of collections the removal of which may ultimately require the aſſiſtance of ſurgery.

Wounds of the receptaculum chyli will be diſtinguiſhed from their ſituation, and from the diſcharge being a thin milky kind of liquor. They muſt neceſſarily be attended with much danger, as they will deprive the patient of the greateſt part, or even of all the nouriſhment which he ought to derive from his food. They can never in any way become the object of ſurgery, but by producing collections in the abdomen which may require to be diſcharged.

§ 9. *Of Wounds of the Kidneys and Ureters.*

In a preceding part of this Work *, we have mentioned the ſituation of the kidneys; an accurate knowledge of which is an object of much importance in judging whether penetrating wounds in theſe parts may have injured them or not. But in general we may be determined by the ſymptoms which take place.

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* *Vide* Vol. II. Chap. XI. Sect. II.

The external coverings of the kidney may be hurt without any ſymptom of importance being induced; but neither the pelvis of the kidney, nor the ureters, can be penetrated without ſome or perhaps all of the following ſymptoms taking place: The patient complains of violent pain, not merely in the part itſelf, but over the whole loins, in the groin, yard, and even in the teſticles; he is liable to much ſickneſs and vomiting; the urine is paſſed with pain and difficulty, and along with it more or leſs blood is uſually diſcharged; and altho' the greateſt part of the wound may heal, it commonly happens that a fiſtulous opening remains during life.

When the kidney is pierced by a wound entering from the belly, the urine is apt to be extravaſated into the cavity of the abdomen: But when it is wounded from the back, or even from the ſide, the urine will either paſs directly out at the opening, or it will ſpread through the contiguous cellular ſubſtance; for as it is ſituated behind the peritonæum, it will not in this caſe find acceſs to the belly. The riſk, therefore, with which wounds of this organ are attended, will depend in a great meaſure on this circumſtance. When the urine paſſes into the abdomen, the danger will be very great; but when this does not happen, if the patient ſurvives the hemorrhagy with which the wound is at firſt attended, he may have a tolerable chance to eſcape, with the inconvenience of a fiſtulous opening, at which the urine will continue to be diſcharged. Inſtances indeed have occurred even of this being at laſt cured; but they are ſo rare, that they are ſcarcely to be looked for. All that art can with propriety attempt, is to prevent the urine from lodging; and, if the ſides of the opening become callous, to render them raw from time to time, either with the ſcalpel or lunar cauſtic, by which they may at laſt be made to unite.

§ 10. *Of Wounds of the Bladder.*

The bladder when empty lies altogether within the bones of the pelvis; but when filled with urine, it riſes conſiderably higher, inſomuch that, when the urine is long obſtructed, there are inſtances of its reaching to the umbilicus. In judging, therefore, whether injuries done to theſe parts have penetrated the bladder or not, we muſt know whether it was empty or full. But for the moſt part this point is eaſily determined; as in general the urine comes away by the wound, and even that which paſſes by the urethra is at firſt always tinged with blood.

The danger from wounds of the bladder is always more or leſs according to the ſituation of the injury. As the upper part of this viſcus lies within the cavity of the abdomen, being covered with the peritonæum, punctures in this part are apt to produce an extravaſation of urine into the belly, by which the moſt dangerous ſymptoms are commonly induced: while the under part of it, not being covered with this membrane, is often wounded without any ſymptom of importance taking place, as we daily obſerve in the operation of lithotomy as it is now practiſed in the lateral method.

In wounds of the under part of the bladder, all that we have to do is to dreſs them in the uſual way with ſimple eaſy applications; while by blood-letting in proportion to the ſtrength of the patient, by the uſe of gentle laxatives, and a low diet, we endeavour to prevent inflammation, the moſt dangerous ſymptom that attends injuries of this viſcus. And when inflammation has already taken place, we try to remove it by farther evacuations of blood, by doſes of opiates proportioned to the degree of pain, by warm fomentations to the belly, and by the ſemicupium. Indeed warmth applied in this manner ſeems to have a more certain effect in removing the pain and tenſion of the abdomen, which theſe wounds are very apt to induce, than almoſt any other remedy.

When again the upper part of the bladder is injured, together with the riſk which occurs from inflammation, we have the additional hazard ariſing from extravaſation of urine.

As the danger with which this is attended is always conſiderable, eſpecially when the urine paſſes into the abdomen, it might give the patient ſome farther chance of recovering, to treat wounds of this kind in the bladder upon the ſame principles, and in the ſame manner, that we have adviſed for wounds of the inteſtines; that is, by ſtitching up the wounded part either with the glover's ſuture, or in the manner we have adviſed in a preceding part of this ſection, as may be ſeen in § 4. The glover's ſuture might anſwer equally well with the other; and here it might be uſed with more freedom than in the inteſtines, as the bladder

der can more readily admit of being ſomewhat diminiſhed in its capacity.

To prevent the inconvenience and danger ariſing from urine being extravaſated into the abdomen, it has been propoſed to draw the opening in the bladder forward to the external wound, and to ſtitch it to the peritonæum and contiguous parts. This may be eaſily done when the anterior part of the bladder is wounded; but when the opening lies behind, to draw it forward and retain it at the wound would be productive of much pain, and might ultimately be attended with more danger than it was meant to prevent. In ſuch circumſtances, I would rather truſt to the wound being neatly ſtitched up, when the parts ſhould be immediately replaced, and the patient treated in the manner we have adviſed for ſimilar injuries done to the inteſtines.

§ 11. *Of Wounds of the Uterus and its Appendages.*

The uterus is a ſtrong muſcular bag peculiar to the female ſex, being ſolely intended for the fœtus. It is of a triangular figure, and is ſituated between the bladder and rectum. In an unimpregnated ſtate, it lies altogether within the bones of the pelvis: but during pregnancy, it riſes ſo high in the abdomen as to touch the umbilicus and even the ſtomach; while the inferior point of it, termed the Os Tincæ, terminates in the vagina, a ſmooth membranous ſheath which runs contiguous to and terminates below the urethra.

The uterus is firmly attached by different ligaments to the contiguous parts: by the ligamenta lata on each ſide, which appear to be doublings of the peritonæum; and by the ligamenta rotunda, which ariſe from the upper corners of the fundus uteri, and paſſing down thro' the openings in the external oblique muſcle, are loſt in the upper part of the thigh. By the tubæ Fallopianæ, which ariſe near to the ligamenta rotunda, the uterus communicates with the ovaria, two ſmall round bodies placed within an inch and a half of its fundus.

From the uterus ſtretching, and occupying different parts in the different periods of geſtation, it is evident that wounds, which in one ſtate might injure it, in others will paſs conſiderably above it: ſo that in judging from the ſituation and direction of a wound in theſe parts, this circumſtance requires particular attention. In extenſive wounds we may be determined at once by examination with the fingers, whether the uterus be injured or not: But in others, where this is not admiſſible, we muſt be directed entirely by the ſymptoms which take place.

In an unimpregnated ſtate, a wound of the uterus will not be productive of ſymptoms very different from thoſe which occur from wounds of the contiguous parts. But during pregnancy, wounds of this organ will either induce ſymptoms of an approaching abortion; or the quantity of blood diſcharged outwardly by the wound, or that is extravaſated into the cavity of the abdomen, will be very conſiderable. At leaſt this will in all probability happen when the injury done to it is material: for during pregnancy, the quantity of blood ſent to the uterus is conſiderable; and we know from experience, that hæmorrhagies which occur from it in this ſtate, ſeldom ſtop till delivery is effected; by which the uterus is allowed to contract, ſo as to compreſs and ſupport the injured veſſels.

In every injury therefore of this kind where ſymptoms of abortion occur, nothing ſhould be done to prevent it; and where they do not take place, and whenever there is reaſon to ſuſpect that the patient may ſuffer from loſs of blood, if the delivery cannot be accompliſhed in the uſual way, the child ſhould be taken out by the Cæſarian operation. In a ſubſequent part of this Work we ſhall have occaſion to deſcribe the method of performing this operation; but in ſuch caſes as we are now treating of, the eaſieſt, and perhaps beſt method of doing it, will be to enlarge both the external opening and the wound in the uterus to a ſize that will admit of the extraction of the child. In other circumſtances, wounds of the uterus muſt be managed nearly in the ſame manner with other penetrating wounds of the abdomen.

Beſides the ſeveral viſcera in the abdomen and pelvis, which we have now treated of, there are large blood-veſſels and nerves which paſs through them, which are alſo liable to be wounded: But as no remedies with which we are acquainted can afford any relief in diviſions of the nerves; and as the large blood-veſſels here lie too deep for any chirurgical aſſiſtance, they very univerſally end fatally. A patient may indeed linger long under the paralytic ſymptoms which always ſucceed to injuries done to theſe nerves; but a diviſion of the large blood-veſſels of the abdomen in every inſtance proves quickly fatal.

We have thus finiſhed the conſideration of wounds of the thorax and abdomen; and it will be obſerved, that we have entered minutely into it. To this I was induced, not merely by the importance of the ſubject, which I conſider, however, as one of the moſt material that practitioners meet with, but with a view to excite the attention of beginners to an intimate acquaintance with the moſt uſeful part of anatomy, that of the thoracic and abdominal viſcera.

In the preceding ſections we have treated ſeparately of all thoſe wounds, which, from the ſituation, or any other peculiarity of the injured parts, may require any variety in the method of treatment. The extremities indeed are liable

able to wounds which require a mode of management that has not yet been attended to, namely, thoſe wounds which are complicated with fractures of the contiguous bones: Theſe, however, will fall to be conſidered in the Chapter on Compound Fractures. The only other varieties of wounds which we have now to ſpeak of, are poiſoned or venomous wounds, and gunſhot wounds.

SECTION XIII.

Poiſoned Wounds.

WOUNDS may be poiſoned in various ways: The bites of ſeveral animals, particularly thoſe of the viper, afford examples of poiſoned wounds; and the ſtings of the tarantula, of waſps, and bees, are of the ſame nature. It is evident too, that poiſon is conveyed to wounds by the bites of mad or enraged animals, particularly by the bites of mad dogs: And they may be poiſoned by the matter or ſecretion of various kinds of ſores, as well as by the juices of diffeerent vegetables.

The ſtings of waſps and bees and other inſects of this climate, although, they may be productive of a good deal of pain, yet ſeldom terminate in any ſymptom of importance: The application of vinegar or ſpirit of wine to the part affected immediately after the injury, will often prevent that pain, tenſion, and inflammation, which would otherwiſe ſupervene: and when once theſe ſymptoms take place, they will for the moſt part be more effectually relieved by waſhing with cold water, or by immerſing the parts in it, than by any other remedy. For the ſting of a ſcorpion we are adviſed to kill the animal and apply it to the injured part, or to cover the part with a dead toad or ſome other animal ſuppoſed to be of a poiſonous nature. There is much cauſe, however, to imagine, that this practice is founded in prejudice; and we are told, that of late the ſame remedies have been found to prove uſeful in the ſtings of inſects in warm climates, that we have juſt mentioned for the ſtings of bees and other inſects of this country.

As the bite of a viper proves ſometimes formidable, at all times it deſerves particular attention. It is true indeed, that it often heals eaſily without any ſymptom of importance taking place; for the poiſon of this animal being contained in a ſmall bag at the root of each tooth, which it can diſcharge or retain at pleaſure, it would appear that it does not throw it out if it be not much irritated. But as we can never judge with certainty whether the wound be poiſoned or not, we ought in every caſe to be upon our guard. To prevent the poiſon from entering the ſyſtem is the object we ſhould have in view. This, however, can only be accompliſhed when the aſſiſtance of practitioners is procured immediately:

for although there is reaſon to ſuppoſe that ſome other kinds of poiſons, even when applied to recent wounds, do not for ſeveral days enter the circulation; yet we know from various occurrences, that this is by no means the caſe with the poiſon of the viper, which commonly begins to operate upon the ſyſtem in the ſpace of twelve or fourteen hours. The patient complains of a violent burning pain in the injured part, which ſoon begins to ſwell. Tenſion and inflammation take place, not merely over the affected limb, but often over the whole body. The patient becomes faint and languid, the pulſe low and feeble; he complains of giddineſs, nauſea, and vomiting; of a fixed pain in the region of the heart; the whole ſurface of the body becomes yellow like the ſkin of a jaundiced patient; the urine appears of a deep yellow, and is evidently ſtrongly impregnated with bile; cold ſweats take place, along with convulſive twitchings in different parts of the body; and if relief be not quickly obtained, death ſoon cloſes the ſcene.

With a view to prevent the acceſſion of theſe ſymptoms, the injured part ſhould either be cut out immediately, or ſhould be deſtroyed with the actual or potential cautery. The ſooner this is done, the more effectual it will probably prove; but it ſhould always be adviſed as long as no bad ſymptom has appeared. In former times ſuction was much employed for the removal of every kind of poiſon in wounds; in ſome caſes by inſtruments kept for the purpoſe, but moſt frequently by the mouth; and it was found where the ſkin of the mouth was entire, that it might be done with ſafety. This might frequently prove ſucceſsful; but where the life of a patient is ſo nearly concerned, that remedy only ſhould be truſted which will with certainty prevent the poiſon from entering the blood. We ſhould not heſitate therefore to adviſe an immediate removal of the injured part; and with a view to render the practice as effectual as poſſible, we ſhould endeavour to excite a plentiful ſuppuration over the ſurface of the ſore; by the application of ſtimulating ointments, when the patient does not complain of pain and tenſion; and by the uſe of emollient poultices, when much inflammation takes place.

But when it appears that the poiſon has already entered the ſyſtem, this local treatment of the ſore is not to be depended on. In ſuch circumſtances, the application of warm oil, not merely to the ſore, but over the whole body, has been much recommended; and it is ſaid that ſome advantage has been derived from the internal exhibition of it: two ſpoonfuls of fine olive oil, given every hour, is ſaid to have allayed the moſt violent ſymptoms which the bite of a viper ever excites. From ſome late obſervations, however, the efficacy of this remedy is much to be doubted; and it would appear that a plentiful ſweat, kept up for a conſiderable time, is the moſt certain method yet diſcovered, not merely of mitigating all the ſymptoms, but of removing them entirely. By whatever means a ſweat is induced, it is found to prove uſeful; but experience ſhows, that ſmall doſes of the volatile alkali, frequently repeated, is to be more depended on for this purpoſe than any other remedy. A particular preparation of this kind, eau de luce, has been much recommended; twenty drops of it to be given every hour. But there is reaſon to ſuppoſe, that any other form of the volatile alkali will prove equally effectual.

All the varieties of theriac, as well as many other remedies, are recommended for the bites of vipers; nay, different remedies are adviſed for the bite of every variety of this animal. But as we do not find that any of them are to be truſted, it is not neceſſary to enumerate them.

The moſt formidable wound of a poiſoned nature which we meet with in this country, is the bite of a mad animal: for although inſtances daily happen of theſe wounds healing without any ſymptom of importance enſuing, yet whenever they terminate in the hydrophobia the utmoſt danger is to be dreaded. Indeed the inſtances of patients recovering from this dreadful ſymptom are ſo extremely rare, that we deſpair in every caſe of any of our remedies proving effectual. A variety of noſtrums have been held forth to the public, by which we are told the hydrophobia may not only be prevented, but even cured when it has actually taken place. I have not heard, however, of any well atteſted fact of any of them proving uſeful.

As a preventative of the hydrophobia, nothing with which we are acquainted can be depended on but an immediate removal of the injured part, either with the ſcalpel or with the actual or potential cautery; which, together with a plentiful ſuppuration being excited upon the ſore, has in different inſtances appeared to anſwer the purpoſe effectually: That is, patients who have been treated in this manner have eſcaped, while others bit at at the ſame time by the ſame animal have ſuffered.

The ſooner that the part affected is removed after the accident, the more effectual the operation will probably prove: but it had better be done even at the diſtance of ſeveral days than that the patient ſhould be deprived entirely of the chance which it affords; and this eſpecially as there is reaſon to imagine that this poiſon does not enter the ſyſtem ſo quickly as a variety of others are obſerved to do; at leaſt this muſt be the caſe if we can judge from the time at which it begins to operate. For we know, that in moſt inſtances none of the ſymptoms induced by the bites of mad animals appear till a conſiderable time after the accident: It almoſt always happens that ſeveral weeks intervene; and it has been known that a perſon has remained perfectly well after the bite for the ſpace of ſix months, and at laſt has been ſuddenly ſeized with hydrophobia. Whenever we are certain, therefore, that a perſon has been bit by an enraged animal, we ſhould adviſe the part to be cut out at whatever period this may be, provided no ſymptom has appeared of the poiſon having entered the ſyſtem: And the ſore ſhould be kept open for a conſiderable time by the daily application of ſome irritating ointment.

While we place moſt confidence in this treatment, we ſhould not neglect entirely any advantages which we are told may be derived from other remedies. Sea-bathing has been much famed in all ages as a preventative of theſe ſymptoms: we have few well atteſted caſes, however, of any benefit being procured from it. By many practitioners, mercury is much depended upon, particularly frictions with mercurial ointment, and the application of it to the ſore; and as this may be employed along with any other plan of treatment that may be adopted, it may be right in every caſe to adviſe it.

It will often happen, however, that neither theſe nor any other means we can employ will prove effectual; and as the province of ſurgery affords no remedy for the ſymptoms which accompany the hydrophobia, as ſoon as they take place, the unhappy ſufferer ſhould immediately receive all the aſſiſtance which phyſicians of experience and obſervation can give.

When wounds are poiſoned by the matter of diſeaſes, as ſometimes happens to ſurgeons in the treatment of ſores, particularly of thoſe of the venereal and cancerous kinds, the beſt practice would be to remove the virus immediately, in the manner we have juſt mentioned in caſes of poiſoned bites, by cutting out the part affected, or burning it with a hot iron. With reſpect to the venereal poiſon, a timid patient may indeed heſitate in the uſe of ſuch a formidable remedy, when he knows that we are poſſeſſed of an antidote which ſeldom fails: Many, however, would endure the momentary pain of a burn or a cut in preference to the ſlow operation of a mercurial courſe. And in caſes of ſores coming into contact with the matter of a cancer, we ſhould not heſitate in adopting the practice immediately; for hitherto we are not poſſeſſed of any remedy upon which any dependence can be placed for the cure of this diſeaſe.

This would likewiſe be the moſt eligible practice in wounds infected with any of the vegetable poiſons. We are told, however, that in thoſe parts of the world where alone it can be neceſſary, that antidotes are univerſally known for every poiſon of this kind; and that the Indians, when they are wounded, can diſcover immediately whether the inſtruments with which they are hurt have been poiſoned or not.

With reſpect to the metallic poiſons, they do not at preſent fall within our conſideration: for however deleterious they prove when taken into the ſtomach, they do not appear to prove otherwiſe hurtful when applied to wounds, than by irritating or corroding the parts with which they come in contact. We are told indeed, that inſtances have occurred of theſe poiſons entering the ſyſtem even when applied to wounds; and this is mentioned as a reaſon for our not uſing the different preparations of lead with ſuch freedom as is now univerſally done. But although remedies of this claſs are daily employed by almoſt every practitioner, we have not heard of a ſingle well marked caſe of their proving in any degree noxious: Nay it is to be doubted, whether even the ſalt or ſugar of lead, as it is termed, proves hurtful, even when taken in conſiderable quantities into the ſtomach. We know that in ſmall doſes it may be uſed with perfect ſafety; and I have much reaſon to think that it may be taken even in large quantities with more freedom than is commonly imagined, from its having happened in different inſtances with patients of my own, who by miſtake have ſwallowed and retained a large cupful of a ſtrong ſolution of ſaccharum ſaturni, without any bad ſymptom enſuing.

SECTION XIV.

Of Gunſhot Wounds.

AS wounds made by fire-arms are ſuppoſed to be very different from every other kind of wound, they are uſually treated of in ſeparate chapters. We think it right in ſome meaſure to adhere to a cuſtom which has long prevailed: but at the ſame time we muſt obſerve, that this difference conſiſts chiefly in the ſymptoms being for the moſt part more ſevere and violent in gunſhot wounds than in others. Till of late, moſt of the ſymptoms induced by gunſhot wounds were ſuppoſed to originate from poiſon carried in with the ball; and it was alſo imagined, that the ball cauterized or burned the parts as it paſſed along. We now know, however, that theſe opinions are both ill founded; that the injured parts do not ſuffer either by poiſon or from the immediate application of heat; and that all the phenomena in any reſpect peculiar to wounds of this kind proceed from the violent contuſion produced by the paſſage of the ball. Of this we are rendered certain, from there being no poiſon contained either in gunpowder or in any of the articles of which bullets are uſually made; and from obſerving that ſymptoms of a ſimilar nature are often induced by contuſed wounds produced by very different cauſes.

I would therefore conclude, that gunſhot wounds are altogether of the contuſed kind; an idea conſonant to the method of cure, and which will tend to do away that myſtery which has hitherto overſhaded this branch of practice.

It has been a prevailing opinion, that there is ſomething ſo ſingular in the nature of theſe wounds, as to render it improper for any practitioners to take the charge of them, but ſuch as have had opportunities of attending fleets and armies, and of ſerving as it were an apprenticeſhip to this branch of practice. There is no good foundation, however, for this opinion; and I have no heſitation in ſaying, that gunſhot wounds ſhould be managed upon the ſame principles, and in the ſame manner, with wounds of any other kind attended with an equal degree of contuſion.

In gunſhot wounds, the ſymptoms we have moſt reaſon to dread are, inflammation, gangrene, and a ſuppuration ſo abundant as to exhauſt the ſtrength of the patient. Theſe are therefore to be chiefly kept in view, and our practice will be more or leſs ſucceſsful in proportion to their mildneſs or ſeverity. In ſome caſes the contuſion is ſo violent and extenſive, that the patient ſuffers from the injured parts being immediately attacked with gangrene.

grene. But, for the moſt part, inflammation is the ſymptom from which the greateſt danger ariſes; for if it be not kept moderate from the firſt, it is apt to terminate either in gangrene or in extenſive collections of matter.

To prevent or remove inflammation ſhould therefore be conſidered as our firſt object in every caſe of gunſhot wound: and as nothing tends with ſuch certainty to accompliſh this as local blood-letting, any veins or arteries that have been divided by the injury ſhould be allowed to diſcharge freely before they are tied: Excepting indeed where ſome of the larger arteries have ſuffered, I believe it would be a good general rule for practitioners not to interfere in checking any hemorrhagy that may take place. In this they would be warranted, not merely by the known powerful effects of local blood-letting in preventing inflammation in general; but by many well atteſted facts, which tend to ſhow that it proves ſtill more particularly uſeful in caſes of gunſhot wounds. Among other proofs of this it may be mentioned, what almoſt every army ſurgeon has obſerved, that ſome of the moſt remarkable cures have occurred among thoſe patients who from neceſſity have been left for a conſiderable time upon the field of battle; by which much more blood is in general loſt than uſually happens with ſuch as either from their rank or other circumſtances are more early taken care of. In every caſe therefore of gunſhot wound, we ſhould at once determine to take as much blood as the ſtrength of the patient will permit; and where the parts are ſo much contuſed that the veſſels which have been divided do not afford a ſufficient quantity, a circumſtance which frequently happens, inſtead of taking it from the arm or any diſtant part of the body, it ſhould be drawn off by the application of a proper number of leeches to the injured parts; or when theſe are wanting, by cupping and ſcarifying the contiguous ſound parts. In general, if this practice be carried a proper length at firſt, the acceſſion of inflammation will be prevented; but when it proves otherwiſe, and when the parts afterwards ſwell and inflame, the operation ſhould be repeated once and again according to circumſtances.

Our next object is to remove any extraneous body that may be lodged in the wound, as far as this can with propriety be done. When a ball has not penetrated deep, and eſpecially when the wound is left entirely open, by a portion of ſkin and teguments being completely removed, there will be little difficulty in clearing away whatever might prove hurtful. But when a wound is found to run to a conſiderable depth, and eſpecially if a counter opening has not been made by the ball paſſing out at the oppoſite ſide, any ſearch that is made for extraneous bodies, ſhould be done with much care and circumſpection. When treating of Punctured Wounds in Section III. of this

Chapter, we entered upon the conſideration of this point. We muſt now refer therefore to what was then ſaid; and at preſent ſhall confine ourſelves to this obſervation, that when extraneous bodies lodged in gunſhot wounds can be taken away without fretting or injuring the contiguous parts conſiderably, they ought always to be removed immediately: but when much pain is excited, or a high degree of inflammation endangered by the attempt, we ought to deſiſt. In ſuch circumſtances, it will be better to truſt to the extraneous bodies being afterwards diſcharged along with the matter of the ſore; to nature preſſing them out; or to the parts in which they are lodged being accuſtomed to their reſidence. From much experience we know, that in almoſt every inſtance bullets ſhould be allowed to remain in whatever part they are lodged, rather than that much force ſhould be employed in extracting them. A ball lodged in the ſubſtance of a bone, is perhaps the only exception to this general rule: It cannot indeed be extracted from this ſituation but with much difficulty; and therefore it is in general allowed to remain. I have known ſeveral inſtances of this; but in all of them much pain and danger to the patient, as well as trouble and perplexity to the practitioner, were the conſequences. The unyielding nature of bone, occaſions, upon the lodgement of a foreign body in its ſubſtance, great pain, tenſion, and ſwelling over all the contiguous parts. To prevent theſe, the extraction of the ball, when it can be done without hazard of the patient's life, ſhould be attempted, as ſoon after the accident as poſſible, and before the parts become ſwelled and pained.

Different forceps have been invented for extracting bullets from wounds, and ſome have propoſed ſcrews for this purpoſe: Scarcely any of theſe inſtruments, however, have anſwered the purpoſe for which they are intended; and excepting where a bullet can be eaſily laid hold of with common forceps, no inſtrument of this kind ſhould ever be employed; for, beſides tearing and irritating the injured parts, they are apt to catch the contiguous muſcles, or other ſoft parts, by which much miſchief muſt neceſſarily be done. There muſt always be a riſk of this when the wound runs deep; but it ought to be more particularly avoided in wounds of the thorax and abdomen, where laying hold of any of the contiguous parts would neceſſarily be productive of danger. When a ball is not deeply lodged, but lies near to the mouth of the wound ſo that the ſurgeon can ſee it, the forceps may with ſafety be employed; but whenever it lies deeper than this, if it be judged proper to extract it, a Counter Opening, as it is termed, ſhould be made upon it, ſo as to admit of its being taken out with the fingers. It will commonly happen, indeed, that balls may be extracted with much more eaſe both to the patient and ſurgeon, by judicious openings of this kind, than by the uſe of forceps or any other inſtrument. The pain and terror which the making of theſe openings are ſuppoſed to excite, are the principal objections to them; but it ſhould be remembered, that in ſuch circumſtances, it is not the preſent eaſe and conveniency of the patient that ſo particularly merit our attention, as his future advantage and ſafety. Nor will the pain induced by cutting directly upon a bullet be ſo conſiderable, as by tearing it out from a deep wound with forceps.

Where the courſe of a ball is of a conſiderable length, this will always be the eaſieſt method of taking it out, when the practice is not forbid by the contiguity of large blood-veſſels and nerves: But when the wound is only of a ſhort extent, inſtead of cutting upon the ball, by making a ſmall opening into it, it anſwers better to lay the wound open thro' its whole length; by which the ball is not only more eaſily extracted, but the cure is afterwards much more readily accompliſhed.

pliſhed. Indeed this practice ſhould be adopted in all ſuch caſes, even when the ball is not lodged. When the two openings made by the entrance and exit of a ball are not very diſtant from each other, and when with ſafety they can be laid into one, it ſhould always be done as ſoon as poſſible after the accident; by which the veſſels which have been injured will be more freely unloaded than they could poſſibly be in any other manner; every kind of extraneous matter that the ball may have carried in, will be brought into view; and the ſides of the ſinus being allowed to collapſe, the ſize of the ſore will thus be diminiſhed.

This being done, the parts affected ſhould be covered with a pledgit of any emollient ointment formed merely of wax and oil, and a poultice of bread and milk ſhould be laid over the whole: a practice which proves much more ſucceſsful, as well as more agreeable, than the application of warm ſtimulating dreſſings; which, till of late, were univerſally uſed in every caſe of gunſhot wound. The pain and irritability which almoſt uniformly attend injuries of this kind, point out the propriety of the moſt ſoothing applications. For the moſt part thoſe we have mentioned anſwer the purpoſe: but in ſome caſes the preparations of lead anſwer better; particularly Goulard's cerate, or the common wax ointment, impregnated with a ſmall proportion of Saccharum Saturni. An opiate ſhould be now adminiſtered; and the part affected being placed in the eaſieſt and moſt convenient poſture, the patient ſhould be laid to reſt.

The formation of matter in every ſore attended with contuſion, is an object of the firſt importance; for till this takes place, there is often reaſon to ſuſpect that gangrene may ſupervene. With a view to haſten it, the warm poultices ſhould be frequently renewed: and they ſhould be continued till the tenſion and ſwelling with which wounds of this kind are uſually attended be removed, and till the ſore has acquired a red healthy granulating appearance; when it will fall to be treated in the manner we have already adviſed for ſores proceeding from any other cauſe.

Gunſhot wounds are commonly deſcribed as being covered from the firſt with deep ſloughs or eſchars; and various remedies are adviſed for removing them. Every appearance, however, of this kind with which they are attended, proceeds entirely from contuſion; and excepting the injury be large and extenſive, the ſlough covering the wound is not often perceptible; or it is ſo thin and inconſiderable, that it diſſolves and comes away with the matter of the firſt or ſecond dreſſing. In ſuch caſes, therefore, it requires no particular attention. And even when it runs to a greater depth, it commonly ſeparates ſo as to be eaſily removed as ſoon as a free formation of matter has taken place: for every ſlough of this kind is a real mortified ſpot; and we have elſewhere ſhown that nothing tends to ſeparate mortified parts with ſuch certainty from thoſe that are ſound, as a free ſuppuration being induced upon them.

In the early ſtages of gunſhot wounds, emollient poultices prove more uſeful than perhaps any other remedy: But it is neceſſary to remark, that they ſhould not be continued after the effects we have mentioned are produced: for when they are too long perſiſted in, they not only tend to relax the parts too much, and to render them ſoft and ſpongy, but are apt to induce too copious a formation of matter; from which the patient is now in greater danger than from any other circumſtance attending his ſituation: For although it is a point of the utmoſt importance in every gunſhot wound, to encourage the formation of pus to a certain extent; yet we find univerſally, that in great quantities it proves very prejudicial, and when once excited that it is with much difficulty checked. We think it alſo right to obſerve, that this ſuperabundance of matter is very apt to proceed from a different cauſe, from the inflammation being allowed to run too high, by which extenſive effuſions and conſequent abſceſſes take place among the contiguous muſcles. This cannot in any way be ſo effectually prevented as by very copious bleedings immediately after the injury is inflicted: It is chiefly with a view indeed to prevent this diſtreſsful occurrence, that we have adviſed the practice of early and copious blood-letting in every caſe of this kind; and with thoſe who have had opportunities of ſeeing the inconveniencies which ariſe from thoſe extenſive ſuppurations that enſue from neglecting it, no other argument will be required to ſhow the propriety of adopting it.

In whatever manner a too copious flow of matter has been induced, the practice to be adopted muſt be the ſame. Every collection that appears muſt be diſcharged by a depending opening; the limb ſhould be laid in that poſture which will moſt readily admit of its running off; the patient ſhould be ſupported by a light nouriſhing diet; and the bark ſhould be plentifully exhibited. It is in this ſtate indeed of gunſhot wounds that bark acts with moſt advantage; when the inflammatory ſymptoms are moſtly gone, and when the patient is ſuffering from too copious a diſcharge. In this ſituation it often proves highly ſerviceable; but in order to act with advantage, it ſhould be given in conſiderable quantities. Elixir of vitriol proves in ſuch caſes a powerful addition to bark.

When notwithſtanding a liberal uſe of theſe medicines, and a proper attention to the other circumſtances we have mentioned, the diſcharge ſtill continues copious, we will often find that it is kept up by detached pieces of bone, or by pieces of cloth, or ſome other extraneous body having been carried in with the bullet. In ſuch circumſtances, nothing will tend to leſſen the quantity of matter till the extraneous body be removed;

for while it remains, it will irritate and inflame the contiguous parts, and effuſion and ſuppuration will be the conſequence. The ſore ought therefore to be again examined; and any looſe body or detached pieces of bone that are diſcovered, ſhould be immediately removed. When the irritation is kept up by pieces of cloth, as they are too ſoft to be diſcovered by the probe, they are apt to paſs unnoticed. When there is therefore reaſon to ſuſpect that any article of this kind is lodged in a ſore, ſome other method is neceſſary for extracting it: And when the parts are ſo ſituated that a cord or ſeton can be introduced along the paſſage made by the ball, nothing will more readily prove ſucceſsful. I have met with different inſtances of pieces of cloth being brought out with the daily drawing of a cord, which were not ſuſpected to be lodged; and in conſequence of which the ſores were ſoon cured, after various attempts to heal them had been made in vain.

We have already adviſed opium as an uſeful medicine in the early ſtages of gunſhot wounds; and by tending more effectually than any other remedy to abate irritation, it proves often ſerviceable in leſſening the diſcharge of theſe ſores, even when they have been of long duration, and when various other medicines have been employed without any advantage. It ought therefore to be preſcribed with freedom whenever the diſcharge appears to be kept up by pain or irritation.

Although in gunſhot wounds hemorrhagies of importance do not always ſucceed the accident immediately, yet they ſometimes take place afterwards. This ſeems to proceed from the arteries being left open and expoſed, when the mortified ſlough which contuſions uſually produce falls off. About this time, therefore, practitioners ſhould be much on their guard againſt ſuch an occurrence, and this eſpecially when the injury is extenſive or ſeated near to any large artrey. The hemorrhagy is often preceded by great heat in the injured parts, and with a throbbing pulſatory pain. At this period it may frequently be prevented by plentiful blood-letting, and eſpecially by the application of leeches to the contiguous parts; but when once the hemorrhagy appears, nothing will prove ſucceſsful, if the veſſels are of any conſiderable ſize, but a proper application of ligatures. As the diſcharge in theſe caſes is often ſo ſudden and violent as to induce much hazard before the aſſiſtance of a practitioner can be procured, patients in ſuch circumſtances ſhould be furniſhed with a tourniquet, with directions to the ſervant in attendance to apply it immediately on the firſt appearance of blood.

Hitherto we have not mentioned the ſcarifying of gunſhot wounds; a practice which we find recommended by almoſt every writer upon this ſubject, and which till of late prevailed very univerſally. By ſcarifying the ſores, it was expected that the ſloughs with which they are ſometimes covered would ſooner ſeparate, and that the cure would thereby be haſtened. Later experience, however, ſhows, that this reaſoning is fallacious; and inſtead of proving uſeful, that ſcarifying very commonly does harm: It creates additional pain and inflammation, at the ſame time that it evidently extends the ſurface of the ſore, while it does not appear to be productive of any advantage. It ſhould therefore be laid altogether aſide. Even the dilatation of gunſhot wounds, ſo much recommended of late, ought to be employed with caution. When the paſſage of a ball is not extenſive, and when the parts through which it has gone can with ſafety be laid open, I believe it would be right in every caſe to do it with freedom from one end of the ſinus to the other: no harm could acrue from it; and there is reaſon to imagine, as we have obſerved above, that it would tend much to forward the cure: But I have never been able to diſcover what advantages could probably be derived from the mere dilatation of the external opening of a gunſhot wound: It is propoſed with a view to give a more free diſcharge to the matter than it would o- otherwiſe have: But in deep narrow wounds, formed by piſtol or muſket bullets, increaſing the diameter of one part of the ſinus, will have no effect whatever upon the reſt of it; and as it muſt evidently do harm, by enlarging the wound, while no benefit can probably accrue from it, I do not heſitate in ſaying that the practice ſhould not be continued. In ſuch caſes, where the wound is either ſo ſituated that it would be dangerous to lay it open from one end to the other, or where it is of too great extent for this practice to be adopted, the paſſing a cord, as we have already adviſed, along the ſinus, will often anſwer our purpoſe. This, however, ſhould never be attempted till the firſt or inflammatory ſtage of the wound is over: for while any degree of pain or tenſion remains, the irritation produced by the cord is very apt to do harm.

But it ſometimes happens even that a cord cannot be employed, owing to the ſituation and direction of the wound. In ſuch caſes, after the pain, tenſion, and other ſymptoms of inflammation are removed, and a free ſuppuration is induced, the ſore muſt be treated in the manner we have already adviſed when ſpeaking of punctured wounds; a proper application of preſſure along the courſe of the ſinus will, in ſuch a ſituation, often effect a cure when it cannot be obtained in any other manner.

It might be expected, that ſomething ſhould be ſaid of the method of managing mortification when it occurs in gunſhot wounds; but it appears to be unneceſſary, as we have elſewhere treated fully of this ſymptom as a conſequence of inflammation*. I think it right, however, to remark, that in gunſhot wounds nothing in general proves ſo effectual in preventing mortification as plentiful evacuations of blood. It will not indeed prevent thoſe parts from mortifying which have been ſeverely contuſed by the ball coming immediately into contact with them: but this is not what in ſuch caſes we have moſt reaſon to dread; for the gangrene which occurs from the contuſion produced by the ball, is commonly circumſcribed, and it is not apt to ſpread. It is that variety of gangrene which ſucceeds to the inflammatory ſtage of gunſhot wounds, of which we have moſt cauſe to be afraid. But when blood-letting is freely practiſed, it ſeldom takes place; or if it does appear, the ſame remedy will often prevent it from ſpreading.

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* *Vide* Treatiſe on Ulcers, &c. Part I.

As bark is found uſeful in many caſes of mortification, it is almoſt univerſally employed in gangrene ariſing from gunſhot wounds. I am ſatisfied, however, that the practice is often founded in error, and that much miſchief has been done by it. When gangrene occurs in a weak debilitated habit, bark may always be given with ſafety; and in ſuch circumſtances it will often prove to be the moſt effectual remedy. But mortification which takes place from gunſhot wounds happens moſt frequeutly in ſtrong plethoric patients, where tonics of every kind prove prejudicial, and where bloodletting and other evacuations are particularly uſeful. In the ſubſequent ſtages even of this variety of gangrene, if the diſeaſe appears to ſpread after all the ſymptoms of plethora and inflammation are removed, bark may be employed with propriety; and in ſuch circumſtances it ſhould be exhibited with freedom; but it ſhould never be given while the inflammatory tenſion and pain continue.

In offering theſe obſervations upon gunſhot wounds, we have hitherto been ſuppoſing that the injury is in ſome degree circumſcribed, or at leaſt that it is not ſo extenſive as to preclude hopes of ſaving the limb in which it may be ſituated; and it is proper to remark, that by due care and attention, wounds of this kind may be often cured, and limbs ſaved, where the firſt appearances were even very alarming. But when a limb is injured in ſuch a manner that there is no reaſonable hope of ſaving it, it would be improper to perſiſt long either in theſe or any other means of cure that have yet been propoſed. By doing ſo, the patient muſt ſuffer unneceſſary pain and trouble, while, at the ſame time, his conſtitution may be ſo much injured as to deprive him even of a chance of recovery upon the removal of the limb. But the attempt to ſave limbs which have ſuffered much by gunſhot wounds, gives riſe to a queſtion of importance, which merits particular diſcuſſion.

In the various battles which occurred in the laſt German war, the number of wounded men was often ſurpriſingly great; of courſe the amputation of limbs became frequently neceſſary. By many it was imagined that the practice was carried much farther than it ought to have been; and it was even alleged, that limbs were often wantonly removed, which with much eaſe and ſafety might have been ſaved. Among others who were of this opinion, Mr Bilguer, ſurgeon to the armies of his Pruſſian Majeſty, wrote a treatiſe, in which he endeavours to prove, that amputation of limbs is very rarely neceſſary, as almoſt every injury for which it is uſually adviſed will admit, he thinks, of a cure, by more gentle means.

As the removal of a limb ſhould never be attempted but in caſes of real neceſſity, the public at large were much indebted to Mr Bilguer for endeavouring to prevent a too general practice of it. There is much cauſe, however, to imagine, that the zeal with which he appears to be animated has made him carry his reſtrictions too far; and that numbers would ſuffer much unneceſſary pain, trouble, and hazard, were they to be generally adopted.

Mr Bilguer thinks, that ſcarcely any caſe of gunſhot wound can be ſo bad as to require amputation. Even where the ſofter parts are much lacerated, and the bones and the joints much injured, we ought always, he thinks, to attempt to ſave the limb: and he aſſerts, that by this practice more lives will be preſerved than by the uſual method of proceeding immediately to amputate. After all the attention, however, that I have been able to give to a ſubject of ſuch importance, in the courſe of my own practice, and after much information obtained from others of experience and obſervation, I am of opinion, that a great deal of miſchief would be done by admitting this as an univerſal rule. I would adviſe, in every caſe where the fleſhy parts of a limb only are merely divided, to make ſome trials for ſaving it; and they will often prove ſucceſsful. Where all the muſcular parts of a limb are much contuſed and lacerated, it would no doubt be in vain to attempt the cure of it; on the contrary, it ſhould be removed at once. But when any conſiderable portion of ſoft parts remains unhurt, although the others ſhould be injured in the ſevereſt manner, if none of the large joints have ſuffered, we ſhould never deſpair of being able to ſave the limb. The contuſed parts may indeed mortify and throw off, and thus an extenſive ſore will be produced: but we know from daily experience, that the largeſt ſores will heal; and if in this we ſhould be diſappointed, we ſtill have it in our power to adviſe amputation, while both the patient and ſurgeon have the ſatisfaction to think that nothing has been omitted that could probably have prevented the neceſſity of employing a remedy of ſuch a diſagreeable nature. And on the ſubject of Amputation we ſhall afterwards have occaſion to ſhow, that in ſuch a ſituation the operation proves uſually more ſucceſsful when a ſore has been of ſome duration, than when employed immediately after the accident.

But when any of the larger joints have been much injured by the ends of the bones which compoſe them being ſhattered or ſplintered, immediate amputation ſhould always be adviſed: for the inflammation which ſucceeds to theſe wounds comes on quickly; and when once it takes place, the operation can never be employed till it be altogether removed. The height to which inflammation is in ſuch caſes apt to proceed, is a powerful argument in favour of early amputation: for when the large joints are materially hurt, the parts ſoon become highly inflamed, notwithſtanding of all that we can do to prevent it; ſo that no time ſhould be loſt in putting the operation in practice. It muſt indeed be allowed, that out of a great number of patients, ſome few might in ſuch circumſtances have their limbs ſaved, even where the joints have ſuffered in the worſt manner: But we cannot allow, with Mr Bilguer, that this is a ſufficient reaſon for the practice which he recommends being generally admitted. It is not the ſucceſs which may attend a few caſes, by which practitioners ſhould be directed, but that which enſues from a general courſe of practice. And this I think may be conſidered as certain, that in ſuch circumſtances as we are now conſidering, more lives would be loſt by attempting to ſave the limbs of patients, than by removing them as quickly as poſſible after the injuries have been received; at the ſame time that the practice would be attended with much leſs trouble and pain to the patient: for the ſore which remains after the removal of a limb is trifling indeed, when compared with extenſive lacerated wounds of the large joints. In the preſent improved method of operating, the former often heals in the courſe of two or three weeks; whereas wounds in the joints, even when they terminate moſt favourably, often continue obſtinate, and produce much perplexity and diſtreſs for ſeveral months, or even for years.

With reſpect to fractured bones in caſes of gunſhot wounds, when a large bone is fractured or ſplintered through its whole extent, and when this is accompanied with much laceration of the correſponding ſoft parts, immediate amputation of the limb will be the ſafeſt practice, and ought therefore to be adviſed without heſitation. But where a gunſhot wound that is not very extenſive is merely accompanied with a ſimple fracture of a contiguous bone, or even where the bone is fractured in different places, if the injury does not extend to the joint, we ought in perhaps every inſtance to endeavour to ſave the limb. By removing the detached pieces of bone, and treating the ſore with attention, we will often have the ſatisfaction of accompliſhing a cure, and of reſtoring patients to the uſe of their limbs, who otherwiſe might have remained lame for life, or who might have been deprived of them entirely.

It is proper, however, to remark, that although this ſhould always be attempted where a patient is to remain in a fixed ed ſituation, and where the regular attendance of a practitioner can be procured, yet after engagements, whether at ſea or land, where the wounded muſt be frequently moved about, and where there is commonly a deficiency of ſurgeons, I believe it would be a good general rule to proceed to immediate amputation in every caſe of gunſhot wound accompanied with a fracture of any of the contiguous large bones. By doing ſo, a few limbs would poſſibly be removed, which with great care and attention might have been preſerved; but I am convinced that more lives would be ſaved by it than by attempting in ſuch circumſtances to purſue any other method of treatment. We ſhall have occaſion, however, to enter more fully upon the conſideration of this ſubject in the Chapter upon Amputation.

CHAP. XXXVII.

Of BURNS.

BURNS aſſume different appearances according to their degrees of violence, and to the manner in which they are produced. Thus, burns which merely irritate the ſurface of the ſkin differ materially from thoſe which corrode or deſtroy it; while thoſe again have a different aſpect from ſuch as affect the more deep ſeated parts, as the muſcles, tendons, ligaments, &c.: And we know that ſuch as occur from the application of boiling water, or any other liquid, differ materially from thoſe which are produced by the direct contact of hot metallic bodies, or of burning combuſtible materials.

Burns which do not deſtroy the cuticle, and which irritate the ſkin only, act nearly in the ſame manner with cantharides and other veſicantia. The irritation which they excite produces an increaſed action in the exhaling veſſels of the affected part, by which veſications are formed in extent and number proportioned to the violence of the cauſe. But when the ſkin or ſubjacent parts are deſtroyed, no veſicles take place. A black mortified ſlough is firſt obſerved; and when this ſeparates and is thrown off, an ulcer is left of a depth correſponding to the degree of heat by which it was produced.

In every caſe of burn the pain is ſevere; but in general it may be obſerved, that it is more conſiderable where the ſkin has been merely much fretted or irritated, than where ſuch a degree of heat is applied as to deſtroy it entirely.

In deep extenſive burns mortification ſometimes takes place to an alarming degree very ſoon after the injury is inflicted; but for the moſt part the ſymptom we have moſt cauſe to dread is inflammation. The pain and irritation which burns excite, are in ſome inſtances ſo violent, that all our efforts are apt to fail in preventing them from inducing the very higheſt degree of inflammation: And when the ſurface of a burned part is extenſive, the effects of this inflammation are not confined to the ſpot which has more immediately ſuffered; they are apt to excite fever; and in many caſes ſuch a degree of torpor is induced, as at laſt ends in death.

In the treatment of every variety of burn, our firſt object ſhould be to procure eaſe as quickly as poſſible. Where the ſkin is not deſtroyed, but ſeems to ſuffer merely from irritation, an abatement of pain may be procured by the application of remedies of very different, and even of very oppoſite natures: By dipping the part affected in very cold water, and keeping it for ſome time immerſed in it, the pain will often be rendered very ſupportable; while on the other hand, a conſiderable degree of eaſe may be procured by plunging the injured part ſuddenly into boiling water, or any other fluid of nearly an equal degree of heat. Emollients are often employed, and in ſome caſes they procure immediate relief; but in general, aſtringent applications prove much more ſucceſsful. One of the beſt applications to every burn of this kind, is ſtrong brandy, or any other ardent ſpirits: it ſeems to induce a momentary additional pain; but this ſoon ſubſides, and is ſucceeded by an agreeable ſoothing ſenſation. It proves moſt effectual when the parts can be kept immerſed in it; but when this cannot be done, they ſhould be kept conſtantly moiſt with pieces of ſoft old linen ſoaked in ſpirits. The Acetum Lythargyrites, a ſtrong ſolution of Saccharum Saturni, or Goulard's ſaturnine water, make uſeful applications for the ſame purpoſe; and as a proof that it is the aſtringency of the remedy which the effects reſult from, the ſame benefit is derived from a ſtrong ſolution of alum, or even from common ink.

It is the common opinion, that remedies of this kind prove chiefly uſeful by preventing thoſe veſications or ſerous exſudations which ſuperficial burns are uſually attended with: But I do not find that the obſervation is well founded; for I have always remarked, that they procure an abatement of the pain ſooner where theſe veſications have already appeared, than when they are employed ſo early as to prevent them from riſing, which they frequently do when they are applied immediately after a burn is inflicted.

Whatever remedy we employ, it ought to be perſiſted in as long as the pain continues; and in extenſive burns, where the irritation is great, along with external applications, opium ſhould be preſcribed in doſes adequate to the degree of pain. Even that ſtupor with which patients in this ſituation are ſometimes attacked, is more readily removed by opium than by any other remedy. As this ſymptom is probably induced by ſome degree of effuſion upon the brain, and as we are to conſider this as an effect of the irritation which always accompanies burns, we may readily conceive that opiates ſhould prove particularly uſeful in removing it: And I have found in a variety of inſtances that they do ſo.

With reſpect to the management of the veſications; by ſome we are adviſed to open them immediately, while others aſſert that they ſhould never be meddled with. In judging from my own obſervation, I would ſay that they ſhould never be opened till the pain ariſing from the burn is entirely gone: for during this period, the leaſt acceſs of air is attended with a great deal of uneaſineſs. But when the irritation produced by the burn is ſubſided, they may be opened with ſafety: And at this period it ought always to be done; for when the ſerum is allowed to reſt long upon the ſkin beneath, it is apt to render it tender, and even to induce ſome degree of ulceration, which might with eaſe be prevented. Even at this time the veſicles ſhould be opened with ſmall punctures inſtead of large inciſions, ſo that as little air may be admitted as poſſible. And after the ſerum is diſcharged, the beſt application that can be made to the part, is a thin liniment of wax and oil, with a ſmall proportion of Saccharum Saturni. Oil by itſelf is too thin, as it runs quickly off; and ointments of the uſual conſiſtence give more pain than a liniment, as their ſtiffneſs prevents them either from being applied or removed ſo eaſily.

In this manner all ſuch burns as we are now treating of, may in general be cured, excepting where they are ſo extenſive as by the irritation which they produce to excite much inflammation and fever. In ſuch circumſtances, blood-letting, and other remedies adapted to the particular ſymptoms, muſt be adviſed; and when the injured part is found to ulcerate, which will often happen in ſevere burns, even where the ſkin remained entire for ſeveral days, thoſe remedies muſt be employed which the nature of the ſore may appear to render neceſſary, and for which we muſt refer to the different ſections of a former publication *.

When, again, burns are from the firſt attended with loſs of ſubſtance, as uſually happens when they are produced by the application of hot metallic bodies, cooling emollient applications prove moſt effectual, the part being kept conſtantly moiſt with a liniment compoſed of equal parts of lime-water and linſeed-oil often gives immediate eaſe; and the eaſieſt way of applying it, is to daub the parts frequently over with a ſoft pencil well ſoaked in it. The application and removal even of the ſofteſt coverings is often pro-

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* Vide Treatiſe on Ulcers, &c.

productive of much pain; and I have always found in burns of this kind, that their being expoſed to the air does not for the firſt two or three days do any harm: On the contrary, it often gives relief when no advantage is derived from any application. But as ſoon as the pain and irritation produced by the burn are removed, the parts ſhould be covered and treated in the ſame manner as ulcers proceeding from any other cauſe. The liniment I have mentioned of lime-water and linſeed-oil, is perhaps the beſt application that has yet been employed in burns of this kind. In ſome caſes, however, I have found that more immediate eaſe has been procured from the application of Goulard's Cerate; or the Unguentum Nutritum; and a weak ſolution of Saccharum Saturni has ſometimes proved ſucceſsful.

In burns ariſing from the exploſion of gun-powder, ſome of the grains of the powder are apt to be forced into the cutis. At firſt they produce much irritation;

tation; and if they be not removed, they commonly leave marks, which afterwards continue fixed and permanent. They ſhould therefore be picked out with the point of a needle or any other ſmall inſtrument as ſoon as poſſible after the accident; and with a view to prevent inflammation, as well as to diſſolve and carry off any particles of the powder which might remain, the parts affected ſhould be kept covered for a day or two with emollient poultices. In other reſpects, injuries of this kind are to be treated in a ſimilar manner with burns produced in any other way.

When parts which lie contiguous are burnt, they are apt to adhere to each other, if ſome pains be not taken to prevent them. This is more particularly the caſe with the fingers and toes, and with the noſtrils and palpebræ. The ſureſt method of preventing it, is to keep pledgits covered with any proper dreſsings inſerted between them during the courſe of the cure.

In the treatment of ulcers ariſing from burns, it is proper to remark, that the parts are very apt to become ſoft and fungous, and to riſe conſiderably above their natural level. When this is obſerved, any emollient applications that may have been previouſly uſed ſhould be laid aſide: ſuch as are moderately aſtringent ſhould be employed inſtead of them; and gentle compreſſion with a roller proves particularly uſeful. Bathing the parts with a common Saturnine waſh, or with lime-water, or a ſolution of alum, often proves ſerviceable; and one of the beſt ointments for this purpoſe is the common Ceratum e Lapide Calaminare. By perſiſting in theſe means, any fungous excreſcences of this kind will, for the moſt part, be ſoon removed; but when they prove obſtinate, they muſt be taken down by the application of burnt alum, blue vitriol, or lunar cauſtic.

CHAP. XXXVIII.

Of TUMORS.

SECTION I.

Of Tumors in general.

EVERY preternatural enlargement, in whatever part of the body it is ſeated, may be termed a Tumor.

Tumors daily occur in one form or another: They are often followed with important conſequences; they frequently give much embarraſſment both to patients and ſurgeons: For theſe reaſons they merit particular attention.

Much variety occurs in the general appearances of tumors, as well as in the method of treatment beſt ſuited for their removal: But ſuch varieties only ſhould be mentioned in a work of this kind as require ſome peculiarity in the method of cure.

Tumors may with propriety be divided into two general claſſes: Into ſuch as are of an acute or inflammatory nature; and ſuch as are chronic or indolent. Authors have for the moſt part diſtinguiſhed them into ſuch as are ſaid to be of a warm nature; and thoſe which they ſuppoſe to be cold, from their being deſtitute of pain and redneſs, ſymptoms which we commonly obſerve to accompany heat. But the terms we have mentioned of Acute or Inflammatory, and Chronic or Indolent, are more ſcientific; at the ſame time that they are more expreſſive of the real nature of the different affections: for it will be found to hold perhaps univerſally, that tumors are acute or indolent, that is, that they are rapid or ſlow in their progreſs, nearly in proportion to the degree of inflammation with which they are attended. I mean therefore to rank in the firſt claſs of tumors, all ſuch as from their commencement are accompanied with inflammation; and in the ſecond, all thoſe which are not evidently accompanied with this ſymptom.

It will unavoidably happen, however, that ſome tumors will be mentioned under one claſs, which, during ſome part of their progreſs, may appear to belong to the other: Thus, a tumor beginning from ſome inflammatory affection, may terminate in a ſtate of perfect indolence; while others, which at firſt were evidently chronic or indolent, may at laſt become highly inflammatory. We ſhall endeavour, however, to characterize them by thoſe ſymptoms which appear moſt obviouſly at their commencement: A mode of diſtinction which appears to be the moſt accurate; for it is not what a tumor may eventually become, but what it actually is on its firſt appearance, that can admit of any deſcription.

CLASS I. *Acute or Inflammatory Tumors.*

Phlegmon, with its conſequences, abſceſs and mortification.
Eryſipelas.
Ophthalmia.
Inflammation of the ear.
Angina, or inflammation of the throat.
Inflammation and abſceſs of the liver.
of the breaſts of women.
of the teſtes.
of the anus and perinæum.
Venereal buboes.
Lumbar abſceſſes.
Paronychia or whitloe.
Chilblains.
Sprains and contuſions.

CLASS

CLASS II. *Chronic or Indolent Tumors.*

Encyſted tumors, uſually ſo termed.
Ganglions.
Swellings of the burſæ mucoſæ.
Concretions and preternatural excreſcences within the capſular ligaments of joints.
Aneuriſms.
The true, the falſe, and varicoſe aneuriſms.
Varicoſe veins.
Hemorrhoidal ſwellings.
Hydropic ſwellings.
  anaſarca or oedema.
  hydrocephalus.
  hydrops pectoris and hydrops pericardii.
  aſcites.
  dropſy of the ovaria.
  hydrocele.
  ſpina bifida.
Swellings in the ſublingual glands.
Tumors containing air.

General emphyſema produced by air eſcaping from the lungs into the cellular ſubſtance, as ſometimes happens from the ſpiculæ of fractured ribs penetrating the ſubſtance of the lungs.

Local emphyſematous tumors produced by putrefaction in a particular part. This is a rare occurrence; but caſes of it are recorded by different authors.

Tympanitis.

Tumors formed by the diſplacement of particular parts.

Herniæ.

- of the brain.
- inguinal and ſcrotal.
- congenital.
- crural.
- umbilical.
- ventral.
- at the foramen ovale.
- in the perinæum.
- of the alimentary canal and meſentery.
- of the omentum.

Herniæ of the liver, ſpleen, and other abdominal viſcera.
of the bladder.
of the inteſtines in the vagina.
Protruſion of the eye-ball.
Prolapſus uteri.
Prolapſus ani.
Tumors formed by the diſplacement of bones in caſes of diſlocation.
Scrophulous tumors.
Bronchocele.
Sarcomatous tumors.
Sarcocele.
Scirrhus.
Cancer.
Polypous excreſcences in the noſe and throat.
Polypi in the ear.
in the uterus.
Condylomatous tumors in the anus.
Excreſcences in the urethra.
Nævi materni.
Warts.
Corns.
Tumors from affections of the bones.

Simple exoſtoſes.
Venereal nodes.
Spina ventoſa.

We ſhall now proceed to conſider ſuch of theſe tumors as have not yet been deſcribed, or that will not more properly fall to be mentioned in ſome other chapter. Of theſe laſt, indeed, all that occur are ſuch as are produced by the heads of bones when diſplaced, which will be conſidered when we come to the Chapter on Diſlocations.

SECTION II.

Of Acute or Inflammatory Tumors.

THE general theory and management of inflammation and its conſequences, have already been fully treated of*:

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* *Vide* A Treatiſe on Ulcers, &c. Part I.

We muſt therefore refer for this part of our ſubject to what was then ſaid upon it: and in conſidering thoſe varieties of tumors in which inflammation takes place, ſuch circumſtances only will be taken notice of as from peculiarity of ſituation, or ſome other cauſe, require a particular treatment.

In the Treatiſe on Ulcers, eryſipelas was mentioned and deſcribed as a variety of inflammation: but as phlegmon, with its conſequences, was the only ſubject which we then meant to diſcuſs, the treatment of eryſipelas was not conſidered; we ſhall now therefore offer a few obſervations upon it.

§ 1. *Of Eryſipelas.*

In phlegmon, the inflammation is circumſcribed. In general, it is deeply ſeated in the cellular ſubſtance; and any effuſion which takes place is for the moſt part converted into purulent matter:

But in eryſipelas, the tumor is diffuſed, and not much elevated; it ſeldom proceeds deeper than the ſkin; and any effuſion with which it is attended is commonly thin and acrid, and is not convertible into pus.

By experience we know, that ſores proceeding from eryſipelas are in general difficult to cure: It ſhould therefore be our firſt object to endeavour to prevent that effuſion of which theſe ſores are the conſequences. By ſome it is alleged, that this practice muſt be attended with riſk, as eryſipelas in general appears to proceed from a conſtitutional affection; and hence we are adviſed rather to encourage the diſcharge of that matter which nature ſeems inclined to depoſite. This obſervation, however, does not appear to be well founded; for it is found that the diſcuſſion of eryſipelatous affections may be attempted with the ſame freedom and ſafety as inflammation of any other kind.

There is a common prejudice againſt

the uſe of unctuous applications, and whatever contains moiſture, in every caſe of eryſipelas; and fine flour, ſtarch, or hair-powder, are almoſt the only remedies employed externally. Theſe are uſed with a view to abſorb the acrid matter, which affections of this kind often throw out in the form of puſtules, and which unctuous and moiſt applications are rather ſuppoſed to encourage. But to me it appears that they prove more uſeful in preventing the effuſion or formation of that matter, than in abſorbing it afterwards. By ſoothing or allaying that uneaſy ſenſation which uſually accompanies eryſipelas, and which they often do very effectually, they neceſſarily tend to leſſen that preternatural exertion of the affected veſſels, which in every caſe of inflammation we conſider as the cauſe of the ſubſequent effuſion; and as they uſually prove more pleaſant in every reſpect than moiſt applications, they ſhould therefore in the firſt ſtages of the diſorder be preferred. It happens

pens indeed, in ſome caſes, that they have little or perhaps no effect in procuring relief. In ſuch inſtances, I have ſometimes found, that by keeping the inflamed part expoſed to the air, and wetting it every now and then with a feather ſoaked in a weak ſolution of ſaccharum Saturni, immediate eaſe has been procured, and no diſadvantage has afterwards occurred from it. In general, however, the dry farinaceous powders anſwer better.

Almoſt an univerſal prejudice has prevailed againſt blood-letting and other evacuations in eryſipelas. And as it is commonly ſuppoſed to be attended with ſome degree of putreſcency, inſtead of evacuations, bark, wine, and warm ſtimulating cordials, have been recommended. It appears, however, that the ideas of practitioners upon this point have not been founded on obſervation: for it is now known, that in every caſe of eryſipelas blood may to a certain extent be evacuated with ſafety; and by doing ſo, and adhering in every reſpect to an antiphlogiſtic regimen, we will in general be almoſt certain of preventing the diſeaſe from terminating in thoſe effuſions which we have mentioned, and which at all times we ſhould endeavour to prevent.

It is proper, however, to remark, that local blood-letting, which in other varieties of inflammation proves highly uſeful, is not here admiſſible: for the orifices by which it muſt be drawn off are very apt to degenerate into thoſe troubleſome ulcers which eryſipelas when it terminates in effuſion is very apt to produce.

By one or more general blood-lettings, according to the ſtrength of the patient; by the uſe of gentle laxatives, mild ſudorifics, and a cooling diet; and by frequently duſting the part affected with one or other of the powders we have mentioned, almoſt every eryſipelatous tumor may be diſcuſſed: But when effuſion is found to have occurred in any conſiderable quantity, it ſhould be diſcharged immediately by a ſmall opening in the moſt depending part of it. In this ſtate of the diſeaſe, emollient cataplaſms are commonly applied with a view to bring the contents of the ſwelling to ſuppuration. This, however, proves always pernicious: for the effuſion being of a nature which cannot be converted into pus, poultices can never be of the ſame uſe as in caſes of phlegmon; and as it is commonly ſharp and acrid, it is apt to do miſchief, by corroding the ſkin and other contiguous parts, when it is allowed to remain. The beſt application in this ſtate of the diſeaſe, is any of the ſaturnine ointments, ſuch as Goulard's cerate, or the common wax ointment, with a ſmall proportion of ſaccharum Saturni.

§ 2. *Of Inflammation of the Ear.*

The paſſage, as well as the bottom of the ear, are entirely membranous; conſequently the inflammation which attacks them proves very painful: for we know that inflammation of membranous parts gives more pain than that of parts of a looſer texture; as the blood veſſels in the former do not yield ſo readily as thoſe of the latter, to the diſtention which always accompanies inflammation.

The remedies to be employed in caſes of this kind ſhould be regulated by the ſtage of the diſeaſe. When the inflammation has ſubſiſted ſo long as to give reaſon to ſuſpect that it will terminate in ſuppuration, which it is apt to do very quickly, emollient applications prove moſt uſeful: the ear ſhould be frequently fomented with warm emollient ſteams; and it often proves ſerviceable to cover the affected ſide of the head with large emollient poultices. But in the commencement of the affection, we ſhould in general attempt to prevent ſuppuration: for it is often difficult to obviate the effects of it when matter is once formed in the ear; and a long continued diſcharge is freqently productive of deafneſs. With this view, nothing proves in general ſo effectual as the application of a ſmall bliſter behind the ear: and by pouring a few drops of laudanum into the paſſage, or of compound ſpirit of lavender mixed with a ſmall proportion of oil, we very commonly have it in our power to remove or abate the pain; and the irritation being in this manner removed, the riſk of ſuppuration enſuing is thereby much leſſened.

Our endeavours, however, for this purpoſe will often prove abortive: In which event, and when it is evident that matter is formed, we ſhould endeavour to bring it off as freely as poſſible, by bathing the ear in warm water, and even by injecting a little warm water into it. By theſe means, we may often put a ſtop to the diſcharge: but when it ſtill continues to flow, aſtringent injections, of lime-water, or of mild ſaturnine ſolutions, ſhould be employed; which ſeldom fail when the diſeaſe is ſolely confined to the ſoft parts of the ear. When the bones of the ear are affected, which in general may be known by the matter having a very offenſive ſmell, and being of a black or dark-brown colour, all that art can do, is to keep the paſſage clear by the uſe of injections. The cure in theſe caſes muſt be left to the operation of nature.

§ 3. *Of Angina.*

Every inflammatory affection of the throat is termed Angina, or Squinzy.

As abſceſſes in theſe parts prove always troubleſome, and in ſome caſes dangerous we ſhould endeavour to cure every every inflammation with which they are attacked by reſolution.

With this view, one or more general blood-lettings ſhould be preſcribed, according to the ſtrength of the patient. Smart purgatives prove particularly uſeful; and ſome advantage is often derived from diaphoretics.

None of theſe remedies, however, can be depended on with ſuch certainty as the local diſcharge of blood from the part affected, and the application of a bliſter to that part of the neck which lies moſt contiguous to it. In Plate LIII. figs. 1. and 3. inſtruments are delineated for the purpoſe of drawing blood from the throat by means of ſcarifications; and when they are employed with freedom on the firſt appearance of inflammation, it will ſeldom terminate in ſuppuration. Fomenting the throat with ſteams of warm vinegar proves ſometimes uſeful; and conſiderable advantage has been derived in different inſtances from aſtringent gargles, of infuſions of oak-bark, of redroſe leaves with a proportion of alum or of the vitriolic acid, and of Saccharum Saturni diſſolved in water. A general prejudice prevails againſt the uſe of any of the ſaturnine applications in the form of gargles, from their being ſuppoſed to be of a poiſonous nature. But although I have often uſed them, I never knew an inſtance of any harm occurring from them; and they have frequently proved highly ſerviceable. In ſmall quantities I believe they might be ſwallowed with ſafety; but we all know that gargles may be employed without any part of the liquor being allowed to go over.

It will often happen, however, that theſe and all other remedies will fail, either from the application of them being too long delayed, or from the violence of the inflammation. When ſuppuration is evidently to take place, it ought to be promoted by the external application of warm poultices to the throat, and by the patient being made to inſpire the warm ſteams of milk or of any emollient decoction by means of the machine delineated in Plate LIII. fig. 2. When matter is fully formed, it ſhould be diſcharged by an opening made into it with one of the inſtruments mentioned above for ſcarifying the throat.

§ 4. *Inflammation and Abſceſs of the Liver.*

The ſubſtance of the liver being ſoft and yielding, we would not *à priori* imagine that it would be liable to inflame. We find, however, that in warm climates, particularly in the Eaſt Indies, this viſcus becomes more frequently inflamed than perhaps any other part of the body; probably from the bile in theſe climates being apt to become ſo acrid as to excite irritation in the parts to which it is applied. In ſome caſes too, inflammation occurs in the liver from external violence.

Inflammation of this part is attended

with a dull, uneaſy ſenſation over all the region of the liver, with colic pains and ſickneſs at ſtomach; the patient is liable to frequent cold and hot fits: and for the moſt part, the colour of his ſkin, as well as his urine, is tinged yellow.

When ſuppuration takes place, and eſpecially when the abſceſs is large, the patient complains of pain extending up the right ſide to the top of the ſhoulder. In ſome caſes this ſymptom occurs even in the inflammatory ſtate of the diſorder; but it happens more frequently after the formation of matter, probably from the weight of the abceſs acting upon the diaphragm and pleura, with which the liver is connected. The region of the liver becomes daily more tenſe; and if the convex part of it be chiefly affected, a ſoftneſs, and even a fluctuation of matter, is often diſcovered through the teguments of the abdomen.

In the commencement of this affection, the ſame remedies which are uſeful in other caſes of local inflammation prove moſt ſucceſsful. Blood-letting ſhould be immediately preſcribed; the quantity to be determined by the ſtrength of the patient: but inſtead of taking it from a vein, it ſhould be drawn off by cupping and ſcarifying the part affected. When the ſcarifications are made of a ſufficient depth, almoſt any quantity of blood may be got in this manner; and no remedy with which we are acquainted proves ſo effectual in removing the inflammation. Bliſtering the pained part is alſo frequently of ſervice; the bowels ſhould be kept moderately open with mild laxatives; and a gentle perſpiration ſhould be encouraged over the whole ſurface of the body.

In general, this treatment will prove ſucceſsful when it has been employed early in the diſeaſe; but when the ſymtoms do not ſoon yield, mercurials ſhould be adviſed without any farther delay: for in the removal of inflammatory affections of the liver, nothing has hitherto proved ſo effectual as mercury in one form or another. The common mercurial pill of the Edinburgh Diſpenſatory anſwers as well as any other; and it ſeems to act with more certainty when conjoined with ſmall doſes of opium. Frictions with mercurial ointment upon the part affected, are ſometimes employed with advantage: But whatever form of the medicine be uſed, it ſhould be quickly carried ſo far as to affect the mouth, which ſhould be kept moderately ſore for ſeveral weeks, unleſs the diſeaſe ſubſides immediately; in which caſe a ſhorter courſe will anſwer the purpoſe.

As it is of much importance in every caſe of this kind to give a free diſcharge to the bile, if the patient does not otherwiſe get regular and eaſy paſſage of his bowels, he ſhould, during the mercurial courſe, have a gentle ſaline purgative every third or fourth day, by which the diſcuſſion of the inflammation is often much promoted.

Suppuration, however, will often take place notwithſtanding all that can be done to prevent it; and when it is known, or even ſuſpected to have happened, an inciſion ſhould be made into the abſceſs to diſcharge the matter. When the abſceſs is ſeated on the convex or prominent part of the liver, and when the quantity of matter contained in it is conſiderable, we will readily diſcover it by the touch; and in this caſe there is no room to heſitate. But even where we have not this circumſtance for our direction, a little attention will often enable us to diſcover almoſt with certainty whether ſuppuration has occurred or not. If along with the pain in the right ſhoulder and neck, which we have mentioned, it is obſerved that the region of the liver is more bulky than it was before, and that the teguments which cover it are become ſoft and oedematous; and eſpecially if the patient complains of frequent ſhivering fits, a ſymptom which very conſtantly accompanies internal ſuppuration; we may conclude with much certainty that matter is formed.

In every ſituation, matter ſhould be diſcharged, perhaps as ſoon as it is known that complete maturation has taken place. But abſceſſes ſeated in any of the larger cavities, eſpecially where they lie ſo deep as the liver or any other of the viſcera, ſhould be opened even before there is reaſon to ſuppoſe that all the effuſed fluids are ſo completely converted into pus as we might otherwiſe wiſh to be the caſe: Indeed this ſhould be conſidered as an eſtabliſhed maxim in practice; for the chance of theſe collections burſting inwardly is much greater than of their burſting outwardly, where the teguments which cover them are thick and ſtrong, when compared with the peritonæum, the only membrane which lies between them and the inteſtines. Abſceſſes of the liver have been known to burſt thro' the diaphragm, ſo as to be emptied into the thorax: in a few caſes the matter has been carried into the duodenum by the common paſſage of the bile; and ſometimes, by the great arch of the colon adhering to the liver, a communication has been formed between them; by which the matter of abſceſſes in this ſituation has been very completely evacuated: but for the moſt part, when it is not diſcharged by an external opening, the abſceſs burſts into the cavity of the abdomen.

With a view to prevent ſuch a fatal occurrence, the aſſiſtance of ſurgery ſhould be immediately called in as ſoon as the appearances and ſymptoms we have mentioned give cauſe to ſuſpect that matter is collected: An inciſion of a ſufficient length ſhould be made with a ſcalpel through the external teguments in the moſt depending part of the tumor; and on reaching the abſceſs, it may either be opened with the point of the ſcalpel or with a lancet; but piercing it with a trocar is preferable, as in this manner we have it in our power to evacuate the matter ſlowly and gradually, which in large collections is a point of importance, and therefore requires attention. Even this opening into the abſceſs, however, ſhould be afterwards enlarged, otherwiſe there would be ſome riſk of its cloſing before the cyſt containing the matter collapſes ſufficiently for the prevention of farther collections. This being done, a pledgit of ſoft lint covered with any emollient ointment, or merely dipped in oil, ſhould be gently inſinuated to a ſufficient depth between the lips of the wound, to prevent them from uniting till the abſceſs collapſes and fills up from the bottom: a proceſs that will be much haſtened by a proper application of preſſure upon the tumefied parts by means of a flannel roller paſſed two or three times round the body.

When the vacuity produced by the diſcharge of matter does not ſoon fill up, it will be proper to introduce a canula to preſerve a free paſſage for any matter that may afterwards form. But this precaution is ſeldom neceſſary; for abſceſſes in the liver heal ſooner, and with fewer inconveniences, than ſimilar affections in perhaps any other part of the body. Indeed this is ſo well aſcertained, that I would adviſe an opening to be made into the abſceſs in every inſtance where there is the leaſt cauſe to ſuſpect that matter has formed in the liver. Many practitioners indeed aſſert, that no attempt of this kind is admiſſible unleſs the abſceſs be ſeated in the convex part of the liver. It muſt be allowed, that abſceſſes in this ſituation are much more acceſſible than ſuch as are ſeated in the concave part of it. But wherever they are ſituated, a proper vent ſhould be procured for the matter; for if it be not evacuated by an external opening, we may conclude almoſt with certainty, that it will be emptied into the abdomen, by which the patient will inevitably die.

In all affections of the liver that occur in warm climates, the bark is commonly employed on the firſt appearance of any of the ſymptoms: The putreſcent tendency of the bile is the oſtenſible reaſon of this. But I believe it will be found that no dependence ſhould be placed upon the bark during the firſt or inflammatory ſtage of this diſeaſe: In this period of the diſorder it may even do miſchief: but when ſuppuration has taken place, and when the matter is diſcharged from the abſceſs, bark will prove equally uſeful, as it is found to do in ſimilar affections of other parts of the body.

When, by too long delay, it unfortunately happens that an abſceſs either burſts into the cavity of the cheſt or into the abdomen, the matter ſhould be drawn off immediately: in the one caſe, by the operation of the empyema, deſcribed in Chapter XXII.; and in the other, by the common operation of the paracenteſis, Chapter XXI.

§ 5. *Of Inflammation and Abſceſſes in the Breaſts of Women.*

The breaſts of women are liable to be acted upon by every cauſe which excites inflammation in other parts of the body: But affections of this kind occur moſt frequently in nurſes by the gorging or ſtoppage of the milk, which almoſt conſtantly takes place from ſudden or imprudent expoſure to cold: The breaſt becomes ſtiff, ſwelled, and painful; the milk runs off in ſmall quantities, but not ſo as to afford any effectual relief; and the patient grows hot and reſtleſs, while much thirſt prevails, along with a full quick pulſe. Practitioners are divided with reſpect to the method of treating caſes of this kind: By ſome it is ſaid, that diſcuſſion of the tumor ſhould always be attempted; while others aſſert, that when this does not ſucceed, it often does miſchief, by inducing ſcirrhous affections, which cannot afterwards be diſſolved, and which are apt to terminate in cancer.

So far as I can judge from my own obſervation, there is no room to heſitate. Our practice in inflamed breaſts ſhould be the ſame as in every caſe of inflammation, wherever it may be ſeated. In the firſt ſtages of the diſorder, diſcuſſion of the tumor ſhould be always attempted;

while it would be in vain, and highly improper, to adviſe it when the ſwelling has been of ſuch duration as to have any tendency to ſuppurate. The riſk of our inducing ſcirrhus by this practice, ſeems to be in a great meaſure imaginary: It rather appears, indeed, that cancer is more apt to occur from the improper management of thoſe ſores which enſue from collections of matter in the mamma, than from any means that can be uſed to prevent the matter forming. We are farther induced to follow the practice, from the great diſtreſs which always attends ſuppuration in the mamma: Indeed, the pain and miſery of the patient is in ſuch caſes often ſo great, that no doubt can remain with unprejudiced practitioners of the propriety of endeavouring in every caſe to prevent it.

It is ſcarcely neceſſary to remark, that the ſame remedies prove uſeful here that ſucceed in the diſcuſſion of inflammation in other parts: But it is truly ſurpriſing, that there ſhould be almoſt an univerſal prejudice in every inflamed breaſt againſt the moſt powerful of all diſcutients, blood-letting. Afraid of this evacuation tending to diminiſh the quantity of milk, we avoid it entirely. In this, however, I am convinced we are wrong. In every caſe of this kind I have been in the practice of bleeding freely. It has not appeared to diminiſh the flow of milk; while its effects in preventing ſuppuration are very great. The quantity of blood to be taken away, muſt always be determined by the violence of the inflammation, and by the ſtrength of the patient: But, in general, the practice will be more effectual, when as much as the patient can eaſily bear to loſe is taken at once, than when the ſame, or even a greater quantity, is taken at different times. Purgatives prove particularly uſeful; and a cooling diet is equally neceſſary here as in any other caſe of inflammation.

As nothing tends more to prevent the diſcuſſion of inflamed tumors than pain nothing ſhould be omitted that can in any degree alleviate this ſymptom: And as no remedy with which we are acquainted, proves ſo effectual in removing it as opium, it ſhould always be given in ſuch doſes as are found to be ſufficient. With a view to remove the tenſion of the breaſt, it ſhould be gently rubbed over with althea ointment, or even with oil: but the external applications which are moſt to be truſted, are thoſe of a cooling aſtringent nature; ſuch as a ſolution of ſal ammoniac in vinegar and water; ſpiritus Mindereri; and all the ſaturnine applications. Cloths dipped in any of theſe ſhould be kept conſtantly applied to the breaſt; by which, and by attention to the reſt of the treatment adviſed above, almoſt every tumor of this kind will be removed; unleſs the inflammation has been of long continuance before the remedies are employed: in which caſe, if the pain and tenſion are conſiderable, it will always be more adviſable to endeavour to bring the tumor to ſuppurate, than to attempt any other method of cure. For this purpoſe, we rely with moſt certainty on a frequent renewal of warm fomentations and poultices; and when matter appears to be fully formed, it ſhould be diſcharged by an opening made in the moſt depending part of the collection: At leaſt an opening ſhould always be adviſed, when it is found that the matter is pointing at an improper part where it would not find a free vent.

In the treatment of thoſe caſes of tumefied inflamed breaſts which occur in nurſing, it is a doubt with many practitioners, whether the milk ſhould be drawn off or not. Indeed many aſſert, that drawing it off, either by continuing the child or with glaſſes, does miſchief; and therefore they adviſe it not to be attempted. I have never obſerved, however, that any inconvenience enſued from it; and as it always procures relief, I adviſe it in every inſtance. When the breaſt is much ſwelled, the nipple cannot be laid hold of by the child: In ſuch caſes the glaſſes repreſented in Plate LXV. may be uſed with advantage.

§ 6. *Of Inflammation of the Teſtes.*

INFLAMMATION of the teſtes may be induced in various ways: By the application of cold; by external violence; and by every other cauſe that tends to excite inflammation in other parts of the body: But the moſt frequent cauſe of it is a gonorrhœa virulenta. The common opinion reſpecting this was, that it occurred from the matter in gonorrhœa falling down, as it was termed, upon the teſtes: And this appeared the more probable from its being obſerved that the teſtes were apt to ſwell upon the diſcharge being ſtopped, at the ſame time that the affection of the teſtes was commonly relieved by a return of the running.

It is now known, however, that no

communication ſubſiſts between the urethra and teſtes by which matter can be conveyed from the one to the other: And the moſt probable opinion is, that in the ſwelled teſtes occurring from gonorrhœa, the inflammation is communicated from the urethra, and ſpreads along the vaſa deferentia to the teſtes.

A ſudden ſtop being put to the diſcharge, whether by the uſe of irritating injections or by any other cauſe, is very commonly attended with an increaſed degree of inflammation; to abate which, nothing proves more effectual than a return of the running. In this way we account more clearly than in any other manner for the effect produced upon the teſtes by the ſtate of the running.

Inflammation of the teſtes very rarely terminates in ſuppuration: but this ſhould not prevent the moſt timeous application of thoſe remedies which we know to be the moſt powerful diſcutients. Blood-letting is perhaps the moſt effectual remedy; but it always proves moſt ſerviceable when the blood is taken directly from the part affected by means of leeches. After diſcharging a ſufficient quantity, the ſwelling ſhould be kept conſtantly moiſt with a ſolution of Saccharum Saturni; the ſcrotum and teſtes ſhould be properly ſuſpended; the bowels ſhould be kept moderately open; a low diet ſhould be preſcribed; and the patient ſhould be ſtrictly confined to a horizontal poſture. When there is the leaſt reaſon to ſuſpect that the conſtitution is tainted with lues venerea, nothing will prove ſerviceable if a mercurial courſe be neglected. And when it appears that the diſeaſe has been induced by the diſcharge having been too ſuddenly checked, we ſhould endeavour to promote a return of it, by bathing the penis in warm water; by injecting warm oil into the urethra; or by the uſe of bougies.

By due attention to a courſe of this kind, almoſt every caſe of inflamed teſticle will terminate favourably; that is, the tumor will be diſcuſſed. But when the contrary happens, either from the uſe of the remedies not being perſiſted in, or from the inflammation being particularly violent, and when ſuppuration is found to take place, the matter muſt be diſcharged by an opening made in the moſt depending part of the abſceſs; which in every reſpect ſhould be treated like collections of pus in other parts of the body.

§ 7. *Of Venereal Buboes.*

Swellings in the lymphatic glands from the abſorption of the venereal virus are termed Venereal Buboes. They may appear in any gland ſeated between a venereal ſore and the heart: but they are moſt frequent in the groin, in conſequence of the abſorption of venereal matter from ſores in the penis. For the moſt part they are produced by matter abſorbed from chancres, and in ſome caſes from the matter of a gonorrhœa: But inſtances likewiſe occur of buboes ariſing without any previous ulceration or diſcharge from the penis, where the matter appears to be abſorbed without any perceptible eroſion of the ſkin.

The moſt material point to be determined in the treatment of a bubo is, whether we ſhould endeavour to diſcuſs the ſwelling, or to bring it to ſuppuration? While it was imagined that buboes were produced by a depoſition of venereal matter from the ſyſtem, it was not ſurpriſing to find practitioners adviſing us in every inſtance to promote their ſuppuration: for on this ſuppoſition it was probable that nature meant to throw off the infection. But now when we know that buboes ariſe from matter paſſing into the ſyſtem; that the quantity of venereal matter is increaſed inſtead of being diminiſhed, by their being brought to ſuppurate; and that the ſores which enſue from them are often extremely difficult to cure; ſcarcely any will doubt of the propriety of endeavouring to remove them by diſcuſſion.

With this view the patient ſhould be put upon an antiphlogiſtic regimen. His bowels ſhould be kept open by the uſe of purgatives; leeches ſhould be applied to the hardened gland; and it ſhould be kept conſtantly wet with a ſtrong ſolution of Saccharum Saturni. Along with theſe, however, mercury ſhould be given in quantities ſufficient for eradicating the diſeaſe: And as we know from experience that mercury proves moſt effectual when it is made to paſs through the diſeaſed glands, it ſhould always be applied in the form of unction to thoſe parts in which the lymphatics of the affected glands are known to originate: a practice which will almoſt uniformly be found to prove more effectual than the direct application of the mercury to the glands themſelves. Thus in the diſcuſſion of a bubo in the groin, friction with mercurial ointment upon the thigh and leg will prove more ſucceſsful than rubbing it upon the gland itſelf. To many this has been long known: and it would appear that the practice could ſcarcely fail of occurring to any who have paid attention to the diſcoveries made by the moderns in the anatomy of the lymphatic ſyſtem *.

When buboes are early noticed, the courſe we are now recommending will ſeldom fail in diſcuſſing them, if the mercurial frictions be properly applied and continued for a ſufficient length of time. It often happens, however, that all our efforts fail, either from the diſeaſe being too far advanced before the mercury is applied, or from the tumor not being altogether venereal, but of a mixed nature; a circumſtance which is not unfrequent. Thus it frequently happens that buboes are combined with ſcrophula and ſcurvy, and in ſome caſes with

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* Farther information may be obtained on this point in a late elaborate publication on the venereal diſeaſe, by the very ingenious Mr John Hunter of London.

with eryſipelas or with common phlegmon. In ſuch caſes we are not ſurpriſed at the failure of mercury: and accordingly we ſometimes find, that inſtead of forwarding the diſcuſſion of the ſwelling, it tends evidently to bring it to ſuppuration. Caſes of this kind prove often very perplexing both to the patient and practitioner; ſo that no point in practice requires more exact attention and diſcrimination: For by proceeding to throw in great quantities of mercury, as is uſually done while buboes continue obſtinate, we often do harm, not merely to the local affection, but to the ſyſtem at large; at the ſame time that in every inſtance the ſafety of the patient requires ſuch a quantity to be exhibited as is ſufficient for eradicating the venereal virus. In all ſuch caſes, the beſt practice, I believe, is, to deſiſt from the uſe of mercury as ſoon as it appears that no advantage is derived from it. In the mean time, by a change of diet and other circumſtances, ſuch an alteration may be effected in the conſtitution that a ſecond trial of mercury may prove ſucceſsful: At leaſt, in different inſtances this has ſucceeded with me, where I had much reaſon to think that perſiſting longer with mercury at firſt would have done much harm.

When it is found that a bubo cannot be diſcuſſed, and that it will probably ſuppurate, a frequent renewal of warm emollient poultices and fomentations are the remedies to be moſt depended upon.

The opening of buboes when ſuppuration has taken place next demands our attention. Some diſſuade us from opening buboes at all, alleging that they heal ſooner when allowed to burſt of themſelves: while a ſmall puncture with a lancet, a longitudinal cut through the whole extent of the ſwelling, or the application of cauſtic, have all had their abettors.

When a bubo is altogether venereal, and not connected with any other diſorder, any of theſe methods will ſucceed, provided a ſufficient quantity of mercury be exhibited: But when a bubo terminates in a ſore difficult of cure, we are too apt to blame the particular method in which it was opened; for in whatever manner it is done, we know that the cure will often prove tedious and perplexing.

The object of practitioners ſhould be nearly the ſame here as in collections of matter in any other part. Such an opening ſhould be made as affords a free vent to the matter; but there is ſeldom any neceſſity for making it larger. In very large buboes, indeed, the teguments are apt to be ſo looſe and flabby, and the texture of the ſkin ſo much deſtroyed, that the cure would be rendered tedious were it allowed to remain. In ſuch caſes it is adviſable to diſcharge the matter with cauſtic applied in ſuch a manner as to deſtroy any part of the teguments that are ſuperabundant. This, however, is ſeldom neceſſary; and for the moſt part it will be found that an opening made from the centre of the tumor, where the matter commonly points, down to the moſt depending part of it, will prove ſufficient. Even a ſmaller opening than this would often anſwer; but it is better to make it of a ſufficient ſize at once, than to be obliged to repeat a very painful operation perhaps once and again, as is often neceſſary when buboes of a large ſize are opened by ſmall punctures. In ſmall buboes, a mere puncture will ſometimes prove ſufficient; nay in theſe, the matter being allowed to burſt, often anſwers extremely well: but when the collection is large, this ſhould never be depended on.

When buboes come forward to full maturation without much injury being done to the ſkin, I have in different inſtances diſcharged the matter by the introduction of a ſmall cord; and the practice has ſucceeded. This requires, however, the teguments to be firmer than they commonly are when a bubo is ready to be opened.

We all know that it is of much importance to prevent the air from finding acceſs to ſores; and as we ſometimes obſerve buboes ooze out the matter which they contain by a number of ſmall openings over their ſurface, and as theſe commonly heal eaſily, I conclude that they do ſo from the openings being ſo ſmall as to exclude the air entirely. In different caſes, I have attempted to imitate nature, by making a number of very ſmall punctures with the point of a lancet over the whole extent of the bubo; and for the moſt part with ſucceſs. The matter comes ſlowly off; the ſides of the abſceſs contract gradually; and when it is completely emptied, we commonly find the whole parts that have been affected ſufficiently firm, without any ſores or ſinuſes remaining.

While means are employed to promote the ſuppuration of a bubo, the patient ſhould ſtill continue the mercurial courſe, by which no time will be loſt; and the ſore, which is the conſequence of the opening, will afterwards heal more quickly than if the mercury had been interrupted. The ſore, however, often proves tedious, even where we are convinced that a ſufficient quantity of mercury has been given, and where there is every reaſon to ſuppoſe that the ſiphylitic virus is eradicated. The edges become hard and livid; the matter thin, ſharp, and fetid; and inſtead of healing, the ulceration gradually becomes more extenſive; or if it heals in ſome parts, it breaks out in others, giving a honey-comb appearance to all the under part of the abdomen and upper part of the thigh.

The ſituation of patients with ſuch ſores is truly deplorable. The pain with which they are attended is often intenſe; the abſorption of acrid matter induces hectic fever; they become hot and reſtleſs through the night; and almoſt a total want of appetite renders them ſoon very emaciated.

As I have happened to be concerned

in a conſiderable number of ſuch caſes, I can ſpeak with ſome confidence of the method of treatment. In the firſt place, we muſt conclude that the patient has taken a ſufficient quantity of mercury, and that no ſinuſes are left in which matter in any quantity will be allowed to lodge. Cicuta in ſuch circumſtances has ſometimes proved uſeful; and I have had different inſtances of the external application of it healing the ſores when no advantage was derived from any kind of ointment. In ſuch caſes it was applied in the form of poultices, by mixing the juice of the freſh herb with the common emollient cataplaſm. I have ſometimes obſerved too, that in the internal exhibition of cicuta, the recent expreſſed juice has proved more effectual than any other form of it. I have given the hyoſcyamus and belladona very complete trials in various inſtances; but no material advantage has ever enſued from them. I have not ſeen any evident effects either from ſarſaparilla or guaiac; but mezereon has in different caſes proved uſeful. In two inſtances of very extenſive ſores of this kind, where the whole groin and contiguous parts were ulcerated, and where none of the remedies mentioned above, nor any of the uſual dreſſings, had any effect, the patients were evidently cured by mezereon alone. A drachm and a half of the rhind of the root, with two drachms of liquorice-root, boiled in three Engliſh pints of water into a quart, makes a decoction of a ſufficient ſtrength. This quantity may be uſed daily.

But the moſt effectual courſe I have hitherto tried, is the application of cauſtic round all the edges and hardened parts of the ſores, at the ſame time that opium in conſiderable quantities is given inwardly. For a conſiderable time I truſted entirely to dreſſings of the emollient kind, being afraid of irritating parts already extremely ſenſible. In ſome caſes a ſaturnine ointment has proved ſucceſsful; and in others the common calamine cerate has anſwered: but for the moſt part, on thoſe days in which cauſtic is not applied, I have found more advantage from the uſe of red precipitate than from any other remedy. In ſome caſes it is neceſſary to ſprinkle it over the ſurface of the ſore in the form of a dry powder; but in others it proves ſufficient to add it to any of the common ointments. Inſtead of creating pain, it commonly removes it; and it ſeldom fails to alter the diſcharge from a thin ſharp ſanies to a thick well digeſted pus.

At firſt the application of lunar cauſtic ſometimes gives pain; but this ſoon ſubſides, and eſpecially when opium is uſed at the ſame time. Indeed opium of itſelf proves often uſeful in ſores of this kind. It has been highly extolled of late for the cure of every ſtage of the venereal diſeaſe. I have had no proof of its ever curing any ſymptom truly venereal; but I have had ſeveral inſtances of ſores remaining after the venereal diſeaſe, even where large quantities of mercury had been given in vain, being completely removed by it. It often appears that ſores of this kind, as well as others proceeding from different cauſes, are kept up by that pain and irritation with which they are uniformly accompanied when the matter is thin and acrid. To me the utility of opium ſeems to depend entirely on its narcotic or anodyne powers. By removing this ſtate of irritability, it deſtroys the diſpoſition in the veſſels of the ſore to form that kind of matter which by its acrimony ſerves to perpetuate itſelf: and this being accompliſhed, if no other interruption takes place, nature alone will ſeldom fail to complete the cure. If this idea be well founded, there can be no neceſſity for giving opium in ſuch large quantities as of late have been adviſed. On the ſuppoſition of opium being poſſeſſed of ſome ſpecific powers in the cure of the venereal diſeaſe, it has been given in as large doſes as the patient could poſſibly bear; and by beginning with ſmall doſes, and increaſing them gradually, there have been ſome inſtances of its being taken to the extent of half a drachm or more two or three times a-day. I have not heard, however, that any advantage has been derived from giving it in theſe large quantities, that did not accrue from a more moderate uſe of it: And in the courſe of my own experience, I have found it equally effectual when it merely leſſened or removed pain, as when given in the largeſt doſes; while the inconveniences which uſually ariſe from theſe have in this manner been avoided.

§ 8. *Of Lumbar Abſceſſes.*

EVERY collection of matter ſeated on any part of the loins, may be denominated a Lumbar Abſceſs. But it is that variety of the diſeaſe we are now to conſider, which originates about the ſuperior part of the os ſacrum; and in which we find, by diſſection, that the matter contained in a cyſt, is lodged on the anterior ſurface of the internal iliac and pſoas muſcles.

Theſe abſceſſes are always preceded by pain and tenſion over the loins; which often ſhoots up along the courſe of the ſpine, and down towards the thighs; and often with difficulty of ſtanding erect. In ſome caſes, theſe ſymptoms are ſuſpected to be nephritic; but for the moſt part the diſeaſe aſſumes the appearance of lumbago. When ſuppuration enſues, ſhivering fits are apt to occur: but the pain, which at firſt was acute, becoming dull and leſs perceptible, the patient is led to conclude that he is getting better, till the matter, after falling down in a gradual manner behind the peritonæum, is obſerved to point outwardly, either at the anus by the ſide of the rectum, or on the upper and fore part of the thigh where the large blood-veſſels paſs out, be-

beneath Paupart's ligament, from the abdomen.

When the matter takes the courſe of the gut, and appears near to the anus, it either ſoon burſts, or is laid open on the ſuppoſition of its being an abſceſs originating in the contiguous parts. But when it paſſes down with the fœmoral artery, which we find to be moſt frequently the caſe, as it lies deep and is covered with the ſtrong tendinous faſcia of the thigh, inſtead of pointing at any particular part, it falls gradually lower, till in ſome caſes it reaches near to the joint of the knee.

The tumor is ſeldom attended with more pain than might be expected to occur from the diſtention of the faſcia and contiguous parts by the matter collected beneath. There is no diſcolouring of the ſkin; the teguments, for the moſt part, retaining their natural appearance to the laſt. A fluctuation of a fluid is evidently diſcovered through the whole extent of the tumor, particularly when the patient is erect; for at this time the ſwelling is always much more tenſe than when the body is lying in a horizontal poſture, when a conſiderable part of the matter runs along the ſac towards its origin in the loins.

We have already obſerved, that this variety of abſceſs, when the matter falls down towards the anus, may be miſtaken for a common phlegmon originating in the neighbourhood of the rectum. But no farther inconvenience can occur from this miſtake, than that the ſore, which enſues from laying it open, or from the matter burſting out, will not ſo readily heal as when the diſeaſe is merely local: And it is probable that this is one cauſe of abſceſſes in theſe parts being in ſome inſtances ſo difficult to cure. But in the more ordinary form of the diſeaſe, where the matter falls down beneath Paupart's ligament, the tumor exhibits appearances ſo ſimilar to thoſe of a crural hernia, that the one has often been miſtaken for the other. Of this I have ſeen different inſtances, even where practitioners of experience were deceived. This proceeds, however, from inattention; for the two diſeaſes may be clearly diſtinguiſhed from each other.

The hiſtory of the riſe and progreſs of the ſwelling ſhould be firſt attended to. A crural hernia uſually appears ſuddenly, without any previous ſymptom, after ſome unuſual exertion; and for the moſt part it is attended with obſtruction to the paſſage of the feces, with vomiting, and other ſymptoms of hernia: And from the firſt, the tumor is attended with pain on being handled. But in the lumbar abſceſs, before the matter appears at the top of the thigh, the patient is previouſly diſtreſſed with the ſymptoms of inflammation over all the under part of his back and loins. No obſtruction of the bowels takes place, nor any ſymptom of hernia; and the patient admits of the tumor being freely handled. In the crural hernia, the ſwelling ſeldom arrives at any conſiderable bulk; and when it does become large, it is by ſlow degrees: no fluctuation is perceived in it; but, on the contrary, it feels either ſoft like dough, or knotty and unequal, according as the omentum or feces contained in it have been long lodged in it or not. But in the lumbar abſceſs, the tumor commonly falls quickly down the thigh for the ſpace of ſeveral inches; a fluctuation is always perceived; and no inequalities are obſerved in it. In the hernia, even when it is not ſtrangulated, ſome degree of preſſure is uſually neceſſary, even when the patient is in a horizontal poſture, to make the contents of the tumor recede. But in the lumbar abſceſs, the tumor becomes flaccid immediately on the patient lying down, whether any preſſure be applied to it or not: And it often happens when the matter has fallen any conſiderable way down the thigh, that the upper part of the cyſt at the top of the thigh is found perfectly clear; that is, a certain ſpace can be diſcovered between the upper part of the matter and the inferior boarder of the abdominal muſcles, which can never be done in any kind of hernia; and which, therefore, in this ſtate of the diſeaſe, is always a certain means of diſtinction. It is ſcarcely neceſſary to obſerve, that in this examination the patient ſhould be erect.

By due attention to theſe circumſtances we may always diſtinguiſh one of theſe tumors from the other. Both indeed may occur at the ſame time in the ſame thigh, by which a mixture of appearances will be produced. This, however, muſt be extremely rare; and when it does take place, as the matter of the abſceſs and the parts protruded from the abdomen will always be contained in ſeparate ſacs, the combination will be eaſily diſcovered.

In the treatment of theſe affections, the period of the diſorder firſt requires our attention. In the inflammatory ſtate of the diſeaſe, the ſtricteſt antiphlogiſtic courſe ſhould be adopted, in order if poſſible to prevent the formation of matter. For the moſt part, we diſcover, that it has been induced by the ſmall of the back or loins having received ſome conſiderable injury, either by a twiſt or a ſevere bruiſe: and if accidents of this nature were immediately treated with that attention which their importance merits, thoſe diſagreeable conſequences which are apt to enſue from them might frequently be prevented. Whenever it is found that a patient, who has ſuffered in in this manner, complains of ſevere pain in the injured part, blood-letting ſhould be immediately adviſed; and as local blood-letting proves always in ſuch caſes moſt effectual, it ſhould be done by cupping and ſcarifying the pained part. The affected parts being deeply covered, the lancets of the ſcarificator ſhould be made to go to a conſiderable depth; for which purpoſe the ſpring of the inſtrument ſhould be ſtronger than uſual, by which means any quantity of blood we may judge proper may be taken with eaſe;

and I am convinced, that by carrying this practice a ſufficient length, we might very commonly, in the early ſtages of the diſeaſe, remove it entirely. It is difficult to ſay when injuries of theſe parts would terminate in ſuppuration or otherwiſe; but I have met with different inſtances, where, from the ſeverity of the pain and other ſymptoms, there was much cauſe to ſuſpect that matter would have formed, if it had not been prevented by a timeous and plentiful diſcharge of blood from the injured parts; a remedy which commonly gives immediate relief to the pain, however violent it may be. But at the ſame time that we depend chiefly on local blood-letting, other remedies which experience ſhows to prove uſeful in inflammation ſhould not be neglected: Of theſe, bliſters, opiates, and gentle purgatives, are to be moſt relied on.

Theſe, however, as well as every other remedy, will in ſome inſtances fail; and in others, practitioners are not called till ſuppuration has taken place, and till the matter has actually begun to point, either in the neighbourhood of the anus or on the fore-part of the thigh. In this ſituation, what are we to do? Are we to allow the matter to remain, or to diſcharge it by making an opening into it? In my opinion there is no room for heſitation: The matter ſhould be evacuated as ſoon as a fluctuation is diſtinctly perceived in the tumor.

I know, however, that practitioners are of different opinions upon this point: for it is alleged, that as theſe abſceſſes are ſo deeply ſeated, it would be in vain to attempt the cure of them; and therefore that no advantage can be derived from their being laid open; while much harm, they obſerve, may accrue from the air being freely admitted to them. But it does not appear that this reaſoning is founded on obſervation. I have always held it as a leading principle in ſurgery, that the matter of every abſceſs ſeated near to any of the large cavities of the body ſhould be diſcharged as ſoon as its exiſtence is clearly aſcertained: So that in the treatment of the lumbar abſceſs, I have uniformly given vent to the matter, without any bad conſequences enſuing; while much miſchief may occur from this being omitted. We find by diſſection after death, that theſe abſceſſes, when of long duration, affect not only the ſofter parts covering the vertebræ of the loins, but the ſubſtance of the vertebræ themſelves; which in ſome caſes have been found carious, and even partially diſſolved in the matter of the abſceſs. Now theſe accidents are ſurely more likely to happen when the matter is allowed to continue in the abſceſs, than when it is diſcharged: at the ſame time, by emptying the ſac, the matter is prevented from burſting into the cavity of the abdomen; which in different inſtances has happened, to the great inconvenience and hazard of the patient. The matter, however, ought certainly to be diſcharged in ſuch a way as to prevent the air as effectually as poſſible from getting acceſs to the cavity of the abſceſs. With this view a trocar may be uſed with advantage. By preſſing the matter down to the moſt depending part of the abſceſs, the ſkin is made ſo tenſe, that a trocar is readily introduced. I tried this in one caſe with very complete ſucceſs; and the patient wore a ſmall canula in the opening for ſeveral months, by which the matter was freely diſcharged. But when the caſe is not perfectly obvious, and when the leaſt doubt remains in the mind of the ſurgeon with reſpect to the contents of the tumor, inſtead of puſhing a trocar into it, the opening ſhould be made in a ſlow gradual manner with a ſcalpel, in the ſame manner as is practiſed in caſes of hernia; ſo that in the event of any of the contents of the abdomen being down, no injury may be done to them.

After the matter has continued to flow for ſome time, and if at the end of two or three weeks the quantity does not become conſiderably leſs, it may prove uſeful to throw up with a ſyringe a weak ſolution of ſaccharum ſaturni, lime-water, or ſome other gentle aſtringent; by which the diſcharge will be gradually diminiſhed, till at laſt it ceaſes entirely. But although this ſhould never happen, and although the patient during life ſhould ſubmit to the inconveniency of a conſtant ſtillicidium of matter from the ſore; yet even this would be preferable to the riſk of allowing every abſceſs of this kind to remain unopened.

As I have happened to meet with many inſtances of this diſeaſe; as practitioners are divided in opinion reſpecting it; and as no diſtinct account of it is given by authors; I have conſidered it more particularly than I otherwiſe might have done.

§ 9. *Of the Paronychia or Whitlow.*

The paronychia is a painful inflammatory ſwelling, occupying the extremities of the fingers under the nails.

Several varieties of this diſeaſe are deſcribed by authors; but there are three only which require to be diſtinguiſhed, and even theſe are all of the ſame nature, the one being only more deeply ſeated than the others.

In the firſt, the patient complains of an uneaſy burning ſenſation for ſeveral days over the point of the finger; the part becomes tender and painful to the touch; a ſlight degree of ſwelling takes place, but with little or no diſcolouration; and if the inflammation be not removed by reſolution, an effuſion is at laſt produced between the ſkin and the parts beneath. On diſcharging this by an inciſion, it is found to be a thin, clear, acrid ſerum; and the removal of it, in general, gives immediate and complete relief.

In the ſecond variety of the diſeaſe the ſame ſet of ſymptoms are produced; only the pain is more ſevere, and it is attended with ſome uneaſineſs over the whole finger and hand. The effuſion which takes place is not ſo perceptible as in the other; and on laying it open, it is found to lie beneath the muſcles of the finger, between theſe parts and the perioſteum.

And in the third, the pain is ſtill more intenſe in the point of the finger, at the ſame time that the whole hand and arm becomes ſtiff, ſwelled, and painful. The lymphatics leading from the finger, and even the glands in the arm-pit, ſwell and inflame; and on making an inciſion into the effuſion, it is found to lie between the perioſteum and bone, the whole phalanx being in general carious.

Swellings of this kind may be produced by various cauſes. They frequently occur from external violence, particularly from punctures and contuſions: But they happen more frequently from cauſes, the nature of which we are not acquainted with.

There are two ſets of remedies employed in paronychia: The one conſiſts of fomentations, poultices, and other emollients; the other of ardent ſpirits, vinegar, and other aſtringents.

As we find from experience that no advantage is ever produced by the effuſion which occurs in this diſeaſe; but on the contrary, that it is always productive of much additional pain, all thoſe applications ſhould be avoided which have any tendency to promote it. Some practitioners have been induced to make uſe of warm poultices, with a view to promote the ſuppuration of the ſwelling, after they have had reaſon to believe that effuſion has taken place. But I have never obſerved any advantrge to accrue from them; and as the ſerum which we meet with in theſe collections is produced entirely from membranous parts, I do not ſuppoſe that it can be converted into pus; at leaſt none of the remedies I have known employed have ever been able to effect it. I endeavour therefore in every inſtance to prevent this effuſion from taking place; by local blood-letting, and by the uſe of aſtringents. Indeed the ſame remedies prove moſt effectual here which are uſeful in the removal of inflammation in other parts. I have had different inſtances even of very violent degrees of pain being almoſt immediately removed by the application of ſeveral leeches over the diſeaſed phalanx of the finger. But in the more violent degrees of it, where the arm ſwells, and by which fever is ſometimes produced, general blood-letting is likewiſe neceſſary, at the ſame time that large doſes of opiates are indicated.

After as much blood is diſcharged by the leeches as is judged proper, the immerſion of the pained parts in ſtrong brandy, or even in ſpirit of wine or alcohol, is one of the beſt remedies: And when the bites are ſomewhat healed, or when leeches have not been employed, ſpirit of turpentine or ſtrong vinegar may be uſed in the ſame manner.

It is proper to remark, however, that it is in the firſt ſtages only of this affection

tion that remedies of this kind can prove uſeful: for when effuſion has actually taken place, that ſtate of the diſeaſe is produced which they were meant to prevent; and it does not appear that they have any effect in removing it. As ſoon as we are convinced that effuſion has occurred, an opening ſhould be made without delay: For we have already obſerved, that it is in vain to attempt to convert the effuſed fluid into pus; and being in itſelf acrid, it is apt to injure the contiguous parts, while at the ſame time the patient is kept in an extreme degree of pain as long as it remains confined. When the collection is ſuperficial, and merely covered with ſkin, this is a very ſimple operation. A puncture with a lancet commonly proves ſufficient: But when the matter is more deeply ſeated, it requires ſome attention to avoid the flexor and extenſor tendons of the finger.

When the matter lies above the perioſteum, all that we have to do is to make the opening ſufficiently large for diſcharging it, and to dreſs the ſore as if it was produced by any other cauſe. But, when the matter lies between the perioſteum and the bone, in every caſe that I have met with, the bone has not only been laid bare, but it has been found to be carious. The common practice is to endeavour to keep the inciſion open till an exfoliation of the diſeaſed parts of the bone takes place; but I have never obſerved any advantage accrue from this. The proceſs is not only extremely painful, but tedious. The matter is apt to lodge beneath the nail; painful fungous excreſcences ſprout out over the ſore, which it is difficult even with the ſtrongeſt cauſtic to keep under; and at laſt it has very commonly happened, after the patient has ſuffered ſeveral months of diſtreſs, that inſtead of a partial exfoliation, the whole diſeaſed phalanx has come away. I am therefore convinced, that much time and trouble would be ſaved both to the patient and ſurgeon, if the diſeaſed bone were immediately removed on making the opening to diſcharge the matter. By making a free inciſion along the whole length of the diſeaſed phalanx, the bone is eaſily removed with common forceps. The pain attending it is indeed ſevere, but it is only momentary: and the meaſure, which does not deprive the patient of the uſe of the joint ſo much as might be imagined, is ſeldom oppoſed when the ſurgeon adviſes it. I have had ſeveral inſtances of people who had in this manner loſt the laſt phalanx of bone in one of their fingers, having ſuch a degree of firmneſs in the parts which remained, as to experience very little inconvenience from the want of it.

When the diſeaſed bone is removed, the remaining ſore commonly heals with eaſe. It requires ſome attention, however, to preſerve the lips of it from adhering till it fills up from the bottom. This is done in the eaſieſt manner by inſinuating a ſmall pledgit between them of ſoft lint, ſpread with any mild emollient ointment.

In every variety of the diſeaſe, excepting in a few caſes of the mildeſt kind of it, we find that the nail is apt to fall off: But this proves only a temporary inconvenience; for when the parts are properly protected, nature never fails to ſupply the deficiency.

In the commencement of paronychia, it is the laſt phalanx of the finger only that is affected: And to whatever extent the pain and ſwelling of the ſofter parts may ſpread, we never find that the bone of the contiguous phalanx ſuffers, unleſs from improper management in allowing the diſeaſed bone to remain, or the acrid matter to lodge too long. In ſuch caſes, the ſurrounding teguments are apt to ſwell and inflame, and ſmall ulcerations to occur over the whole extent of the carious bone. In this ſituation we are often under the neceſſity of adviſing the finger to be amputated, in order to prevent

vent the diſeaſe from ſpreading to the hand.

§ 10. *Of Chilblains.*

THESE are painful inflammatory ſwellings to which the fingers, toes, heels, and other extreme parts of the body, are liable, on being much expoſed to ſevere degrees of cold. The tumor is for the moſt part of a deep purple, or ſomewhat of a leaden colour: the pain with which it is attended is not conſtant, but ſhooting and pungent; and in general, it is accompanied with an inſupportable degree of itching. In ſome caſes the ſkin remains entire, even although the tumefaction be conſiderable; but in others it burſts or cracks, and diſcharges a thin ſomewhat fetid matter. And where the degree of cold has either been very great, or the application of it long continued, all the parts that have been affected are apt to mortify and to ſlough off, when a very foul ill-conditioned ulcer is always left.

We have obſerved above, that it is the extreme parts of the body chiefly that are liable to be attacked with chilblains: and we likewiſe find that delicate children and old people are more apt to ſuffer by them than thoſe who are robuſt. It is alſo remarked, that they are particularly ſevere in people of a ſcrophulous habit.

The beſt preventative of chilblains is to avoid expoſure to cold and dampneſs: And when once a perſon has ſuffered from ſwellings of this kind, if the injured parts be not protected by ſufficient coverings, he will be liable to a return of them every winter. Much diſtreſs, therefore, and inconvenience, may be prevented by due attention to this circumſtance.

The utmoſt care, however, will not always prevent chilblains. In this caſe, it is often in our power to mitigate the complaint, by bringing the affected parts gradually to their natural heat, inſtead of warming them more quickly. The patient ſhould not be allowed to approach a fire: inſtead of which, he ſhould be put into a cold apartment; and the froſt-bit parts ſhould firſt be well rubbed with ſnow, and afterwards immerſed in the coldeſt water that can be procured: for nothing ſo certainly proves hurtful to parts in this ſtate as heat being ſuddenly applied to them. Even ſnow and cold water afford a warm ſenſation to parts attacked with chilblains; but it is found by experience that no detriment enſues from this. After the parts have been treated in this manner, the patient may in a gradual way be brought into a greater degree of heat; but he ſhould for a conſiderable time keep at a diſtance from fire. Rubbing the parts with ſalt will in this ſituation prove uſeful; and immerſion in warm wine is likewiſe employed with advantage.

A patient much benumbed with cold ſhould not even have cordials given to him ſuddenly. A glaſs of cold wine may at firſt be allowed. Afterwards warm wine may be given, either by itſelf or mixed with ſome of the warmer ſpices: and when ſtronger cordials are required, ardent ſpirits may be employed.

Remedies of this kind, however, are only neceſſary in the more ſevere degrees of theſe affections. In common caſes of chilblains that occur in this country, as ſoon as the part is perceived to be affected, it ſhould be well rubbed either with ſpirit of turpentine or with camphorated ſpirit of wine; and pieces of ſoft linen moiſtened in one or other of theſe ſhould be kept conſtantly applied to it. In this manner we have it often in our power to remove ſwellings which otherwiſe would be productive of much diſtreſs: But we muſt again obſerve, that the beſt advice that can be given to ſuch patients as are liable to them, is to protect the parts that are moſt expoſed to ſuffer from cold as much as poſſible during the winter; and when they accidentally get wet with ſnow, which proves more particularly hurtful than any other kind of moiſture, they ſhould be as quickly cleared of it as poſſible.

As there are ſome patients who ſuffer ſeverely with chilblains every winter, either in their fingers, arms, toes, heels, or lips, our being able to prevent them without that inconvenience which always occurs from confinement and much caution, would often be an object of importance: and it is a point upon which practitioners are frequently conſulted. I have had different inſtances where ſea-bathing during the ſummer ſeaſon has appeared to prove uſeful: and in one patient who had ſuffered ſeverely from the effects of cold for ſeveral winters, I adviſed a chamber-bath to be uſed even during the winter; by which the parts which uſed to ſuffer were ſo much ſtrengthened, that ſeveral years have elapſed without any return of the diſeaſe.

When chilblains ulcerate, by the teguments being altogether thrown off, or merely cracking and oozing out matter, warm poultices and emollient ointments are commonly employed. For the purpoſe of cleanſing the ſores, and inducing a diſcharge of right matter, poultices may with propriety be adviſed for a few days; but they ſhould never be long continued: Nor ſhould emollient ointments be much perſiſted in; for they very univerſally induce fungous excreſcences over the ſores, which afterwards it is ſometimes difficult to remove. The daily application of cauſtic to the edges of the ſore, and dreſſing the ſore itſelf with common digeſtive ointment, mixed with a large proportion of red precipitate, are the beſt preventatives of this. The common ſimple diachylon plaſter, ſpread upon thin leather, makes an uſeful application for ſores of this kind.

§ 11. *Of Sprains and Contuſions.*

CONTUSIONS of the ſofter parts of the body, and ſprains of the tendons and ligaments of joints, are uſually productive of immediate painful inflammatory ſwellings.

The ſlighter affections of this kind ſeldom meet with much attention; but when the injury is ſevere, it often requires the utmoſt ſkill of the practitioner, as well as the greateſt caution on the part of the patient, to remove thoſe effects which enſue from it, and which otherwiſe might continue during life.

An increaſed action in the arteries of any part, by which red globules are forced into veſſels which naturally do not admit them, will account for all the phenomena which uſually attend inflammation: But in the ſeverer degrees of ſprains and contuſions, along with an increaſed action of the arteries in the part, which muſt neceſſarily reſult from the pain with which they are accompanied, it is evident that inſtantaneous effuſion likewiſe takes place, from the rupture of many of the ſmaller veſſels of the part. In no other way can we account for thoſe very conſiderable tumors which often riſe immediately after injuries of this nature. For the moſt part the effuſion muſt be of the ſerous kind, as the ſkin uſually retains its natural colour for ſome time after the accident: But the tumefied parts are ſometimes of a deep red, and on other occaſions of a leaden colour, from the firſt; owing to a rupture of ſome of the veſſels containing red blood.

In the treatment of ſprains and contuſions, there are two circumſtances which chiefly require attention. In the firſt place we ſhould endeavour to prevent the ſwelling, as far as it can poſſibly be done; and afterwards thoſe remedies ſhould be employed which we know to prove moſt powerful in preventing or removing inflammation.

It is alleged, indeed, by ſome practitioners, that the ſwelling which occurs from this injury never does harm, and therefore requires no particular attention. In contuſions of the cellular ſubſtance, or even of the muſcles, I allow that this is often the caſe; for to whatever extent the tumefaction may proceed, the effuſed fluid is in theſe parts very commonly abſorbed. But even here the ſwelling in ſome caſes proves extremely obſtinate: and in ſprains of the tendons and ligaments, a very troubleſome, painful thickneſs of the parts that have been injured is apt to continue for a great length of time; in ſome caſes, even for life: And I have commonly obſerved, that this has in general been nearly in proportion to the ſize of the tumor which occurred at firſt; for it would appear that effuſions thrown out by ligamentous parts are not ſo readily abſorbed as thoſe which occur in other parts of the body.

Hence in every accident of this kind, it is an object of importance to prevent the ſwelling from arriving at any conſiderable magnitude.

With this view, aſtringent applications are moſt to be depended on; ſuch as the lees of red wine, ardent ſpirits of every kind, and vinegar. By immerſing a ſprained or contuſed part in any of theſe immediately on receiving the injury, if the effuſion be not altogether prevented it will at leaſt be rendered much leſs than otherwiſe it probably would be. And it often happens that the immediate application of cold proves equally uſeful. Plunging a ſprained limb into the coldeſt water that can be procured, or even into water rendered artificially colder than natural, is a practice that often proves uſeful; and it ſhould be always adviſed in the firſt place, till one or other of the articles mentioned above can be procured; for as the effuſion takes place, as we have already obſerved, very quickly, no time ſhould be loſt in the application of the remedies.

It fortunately happens, that thoſe applications which prove moſt effectual in preventing the effuſion that enſues from ſprains prove likewiſe uſeful in preventing inflammation. But as this ſymptom is in ſevere ſprains apt to proceed to a great height, other remedies are required in the treatment of it; and none that I have ever employed prove ſo effectual as local blood-letting. By the time that the cold water and other diſcutients we have mentioned may be ſuppoſed to have produced any effect, which will be in the ſpace of an hour, a number of leeches ſhould be applied over all the tumefied part: or, in contuſions of fleſhy muſcular parts, cupping and ſcarifying will be found to anſwer equally well. But in whatever way it be done, a quantity of blood ſhould be drawn off ſomewhat proportioned to the ſtrength of the patient and violence of the injury.

For a conſiderable time I have been in the conſtant practice of employing local blood-letting in ſprains and contuſions of every kind; and in all of them, whether the injury has been ſlight or ſevere, it has proved an uſeful pleaſant remedy. In the ſlighter kinds of ſprains, one plentiful evacuation of blood by means of leeches, will in general prove ſufficient: But when the parts are much injured, we are under the neceſſity of applying them repeatedly. They ſhould be ordered indeed from time to time, as long as any conſiderable pain remains in the affected parts. Even when the inflammation and ſwelling of the teguments are entirely gone, a fulneſs or thickening is often diſcovered in the tendons and other deep ſeated parts; and we conclude, that they continue inflamed, as long as they are much pained either upon preſſure or upon motion. In this ſituation nothing ever proves ſo effectual as the application of leeches: The remedy indeed ſeems to prove equally uſeful, whether the inflammation be ſeated entirely in the ſkin, or in the more deep ſeated parts; ſo that it ſhould not in any caſe be omitted.

In violent ſprains the pain is often ſo ſevere, as to induce quickneſs of pulſe and other ſymptoms of fever. In ſuch caſes, along with local blood-letting, it is ſometimes neceſſary to take blood from ſome of the larger veſſels. Opiates become neceſſary, together with all the remedies that prove uſeful in fevers ariſing from inflammation.

After blood has been freely evacuated from a ſprained part, the beſt application that can be uſed for ſome days at firſt, is a ſolution of ſaccharum ſaturni: and afterwards, when a thickening of the tendons continues, as ſometimes happens notwithſtanding the utmoſt attention, pouring warm water upon the part two or three times daily, for the ſpace of a quarter of an hour or ſo each time, proves often an uſeful remedy. Even common ſpring water frequently anſwers the purpoſe; but it ſeems to prove more penetrating when ſlightly impregnated with ſea ſalt: and we have likewiſe reaſon to think that the warm waters of Bath and Buxton are rendered more effectual in caſes of this kind by the impregnations which they contain, than they otherwiſe would be.

Along with warm bathing, frictions with emollient applications prove often ſerviceable in removing this thickening of the parts induced by ſprains. But in order to prove uſeful, they ſhould be perſiſted in for a conſiderable time.

During the cure of a contuſion or of a ſprain, the injured part ſhould be kept as much as poſſible in an eaſy poſture. In every inſtance this ſhould be attended to: but it becomes more particularly proper when the pain is more ſevere than uſual; an occurrence which we often ſuppoſe to happen from the fibres of ſome of the ſprained tendons being ruptured, and which nothing will cure ſo readily as the limb in which it has happened being kept for a conſiderable time in a relaxed eaſy poſture.

We have already mentioned the warm bath as a remedy in ſprains. In various caſes cold bathing alſo proves ſerviceable. After ſprains have been of ſome duration, the injured part is apt to continue weak and relaxed, even when the pain and ſwelling are moſtly gone. In this ſituation, cold water being poured upon the part from a height, or being ſuddenly daſhed upon it, and repeated once or twice daily, will prove more effectual in ſtrengthening the weakened limb than perhaps any other remedy. It is for the removal of debility only, however, that it ſhould be employed; and there is much reaſon to think that it has done miſchief when uſed in the more early ſtages of ſprains. While that thickening of the tendons and ligaments remains, which we have mentioned above, and which often proves the moſt formidable, as well as the moſt obſtinate ſymptom which accompanies ſprains, cold bathing ſeems to do harm, by rendering it more firm than it was before, while the contrary effect often reſults from a proper application of warm water.

A bandage or roller applied over the injured parts, as tight as the patient can eaſily bear it, proves often uſeful in ſprains. By ſupporting the relaxed parts, it not only prevents pain, but the oedematous ſwellings alſo, to which ſprained limbs are often liable. The roller ſhould be of flannel, which yields more readily than linen to any variety in the ſize of the limb, and is the moſt effectual preventative of the rheumatic affections with which limbs that have ſuffered much from ſprains are liable to be attacked. The roller muſt be carried ſpirally upwards from the inferior part of the limb, with an equal preſſure on every part of it, in order to prevent oedema, which might otherwiſe take place.

SECTION III.

Of Chronic or Indolent Tumors.

THE general character of this claſs of tumors is, that they are ſlow in their progreſs, and not neceſſarily attended with inflammation. Tumors of every kind may eventually, indeed, induce inflammation: Thus ſwellings, which have long remained indolent, by an increaſe of bulk will often diſtend the ſkin ſo much as to become inflamed; and all the varieties of hernia, although not neceſſarily accompanied with this ſymptom, for they frequently take place without it, yet they often tend to induce it, for reaſons too obvious to require being mentioned. But in theſe, we conſider inflammation as an accidental occurrence only, and in no way connected with their riſe or formation. Of the chronic tumors we ſhall firſt conſider the encyſted.

§ 1. *Of Encyſted Tumors.*

Every tumor might be conſidered as encyſted the contents of which are ſurrounded with a bag or cyſt, as is the caſe with all the variety of herniæ and of hydrocele, as well as with ſome other tumors; but in common practice thoſe tumors only are termed Encyſted that are contained in cyſts of a preternatural formation. In common language, theſe, as well as various tumors of the ſarcomatous kind, are termed Wens.

The different parts of which an animal body is compoſed, are connected together by a common medium termed the Cellular Subſtance; which is ſo univerſally diffuſed, that it ſeems to form a very conſiderable part of every fibre. In a ſtate of health the cells of this ſubſtance communicate with each other; and, like the large cavities of the body, they are kept ſoft and moiſt by a ſecretion that is conſtantly paſſing into them by the exhalants, and returning from them by the abſorbents. In ſome parts of the body this ſecretion would appear to be entirely of a ſerous nature; while in others, it conſiſts evidently of oil or fat.

While the abſorption of this fluid is in proportion to the quantity exhaled, no accumulation will take place: but various cauſes may concur to deſtroy the equilibrium; and in whatever way this may be done, if more be ſecreted than is carried off by the abſorbents, a fulneſs or ſwelling muſt neceſſarily enſue. Where this ſuperabundance is of the ſerous kind, a dropſical ſwelling will be produced; when of an oily nature, obeſity or fatneſs will take place.

A general diſpoſition in the ſyſtem to this kind of accumulation is a frequent occurrence; but cauſes ſometimes occur by which collections are produced in particular parts. In a ſound ſtate of the cellular ſubſtance, that natural communication we have mentioned as ſubſiſting between the different cells of it, muſt neceſſarily prevent any partial or circumſcribed collection. And accordingly we know, that all ſerous effuſions very readily paſs from one part of it to another. But this communication may be interrupted by different cauſes, and accumulation of the natural fluid may take place in a particular part.

We thus account for the formation of encyſted tumors; to which different names have been applied, according to the conſiſtence or ſuppoſed nature of their contents. When of the conſiſtence of honey, the tumor is termed Meliceris: when of a ſoft cheeſy conſiſtence, or reſembling dough, it is termed an Atheroma; and Steatoma, when it is formed of fat.

But it is proper to remark, that there are various degrees of conſiſtence to be obſerved in each of theſe. Thus the ſteatoma is ſometimes ſoft like butter, and at other times firm like ſuet: and the ſame kind of variety occurs in the contents of the atheroma and meliceris, which in ſome caſes are equal in firmneſs to new cheeſe, and in others are not firmer than the thineſt honey.

The matter forming the ſteatomatous tumors, we conclude to be from the firſt of an oily or fatty nature; and that their different degrees of conſiſtence will depend upon the remora of their contents, and upon the quantity of the thinner parts of them that have been abſorbed. And we think it probable, that the atheromatous and melicerous tumors are originally formed by a depoſition of ſerum, with perhaps a conſiderable proportion of coagulable lymph; and that the degrees of conſiſtence of which we find them, will depend upon various cauſes: Upon the particular quantity of coagulable lymph contained in them; upon their being of longer or ſhorter continuance; and particularly, upon their having been inflamed or not; and to the extent to which the inflammation may have proceeded.

For the moſt part, a practitioner accuſtomed to this branch of buſineſs will be able to diſtinguiſh pretty exactly the nature of theſe tumors before laying them open. Thus, in general, the ſteatoma is of a firm conſiſtence: it is commonly looſe, and rolls more readily than the others under the ſkin; and its ſurface is apt to be unequal: The atheroma is ſoft and compreſſible, but no fluctuation is obſerved in it: While, in the meliceris, the fluctuation of a fluid or thin matter is in general very diſtinctly perceived. It is proper, however, to remark, that neither theſe, nor any other means of diſtinction, will at all times prove ſufficient: for in ſome caſes the ſteatoma, inſtead of being firmer than the others, is conſiderably ſofter; inſomuch that I have met with different inſtances of the fat of which they are formed, fluctuating or moving between the fingers like thin purulent matter; and where accordingly the opinion that was previouſly formed of it was commonly erroneous. The atheroma and meliceris are ſometimes combined in the ſame tumor: One part of it will be evidently of a ſoft pultaceous nature, and contained in a ſeparate cyſt or cell from the reſt, which is probably of nearly the ſame degree of conſiſtence with purulent matter. In a few caſes too, the ſteatoma is conjoined with theſe; but this is not a frequent occurrence.

In judging of the nature of theſe tumors, ſome advantage may be derived from attending to their ſituation. Thus we obſerve, that in ſome parts of the body, fat is much more apt to be ſecreted and depoſited in the cellular ſubſtance than in others. In ſome parts, indeed, fat is ſcarcely ever found in it; as is the caſe over a great part of the head; while in others, particularly over the prominent part of the abdomen, we commonly meet with it even in the leaneſt ſubjects. Now I believe it will be obſerved, that the ſteatomatous tumors are ſeldom if ever met with in thoſe parts of the body which are not uſually in a ſtate of health ſupplied with fat: at leaſt this has been ſo uniformly the caſe in the courſe of my practice, that I have never met with an inſtance of it; and it tends much to confirm the idea which I have endeavoured to eſtabliſh of the formation of theſe tumors. The head, as I have obſerved, is very ſparingly ſupplied with fat, at the ſame time that we find it more liable than any part of the body to encyſted tumors; but they are very univerſally of the atheromatous or melicerous kinds *. Nor have I ever met with the ſteatomatous tumor but where fat is uſually depoſited in the contiguous cel-

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* By Atheromatous and Meliceróus, I mean to expreſs different degrees of conſiſtence of a curdy pultaceous matter. By ſome, the firmer kinds of this have been miſtaken for and deſcribed as the contents of the ſteatomatous tumor; but they will be found to be in every reſpect different from the fatty ſubſtance contained in the real ſteatoma.

lular ſubſtance. They are rarely indeed obſerved on that part of the body which, we have juſt obſerved, is plentifully ſupplied with fat. We ſeldom meet either with theſe or any other variety of encyſted tumor on the abdomen; and at firſt view this may be conſidered as an objection to our theory: On farther attention, however, it will rather appear to ſupport it. The parietes of the abdomen being formed of ſoft yielding parts, with no bone or hard body beneath, we may readily ſuppoſe that they will be little if at all affected by any ordinary preſſure: ſo that this cauſe of obſtruction will not here have the ſame effect as it evidently has on the head and other parts where the cellular ſubſtance lies immediately contiguous to bone.

All the tumors of the encyſted kind are ſmall at firſt, and increaſe by very ſlow degrees. They are of very different ſhapes and ſizes: In ſome they reſemble a walnut; on the head they are commonly round and ſmooth, and do not often arrive at any great bulk; but in other parts of the body they are often of very irregular forms, at the ſame time that they are more apt to acquire more conſiderable degrees of bulk. I have met with ſteatomatous tumors weighing upwards of twenty pounds; and they are ſometimes double this weight. They are never at firſt attended with pain; and the ſkin for a conſiderable time retains its natural colour. But when they become large, the veins of the ſkin, as well as thoſe of the ſac, become large and varicoſe; and the prominent part of the tumor acquires a clear ſhining red colour, ſimilar to that which accompanies inflammation: but it ſeems to be different from this, as it is ſeldom attended with pain, excepting it be injured by external violence. In this ſituation, indeed, a blow or a bruiſe will readily excite inflammation, by which the ſkin will become tender and painful, and by which it will ſoon be made to crack or burſt, if it be not prevented by the contents of the tumor being diſcharged by an operation.

This is the ordinary progreſs of theſe tumors: But it is proper to remark, that although they never advance quickly, yet in ſome ſituations they terminate much ſooner than in others, and without arriving at the ſame degrees of magnitude. Thus, in the head they do not uſually become bigger than a large egg. In a few caſes, indeed, they are larger; but for the moſt part they terminate before they acquire this ſize, by the teguments becoming tenſe and thin, and even burſting if they be not prevented in the manner we have mentioned. But on other parts of the body, particularly on the back, on the ſhoulders, and thighs, the teguments will ſometimes retain their natural appearance long after a tumor has acquired a very great bulk. This ſeems to proceed from a greater or leſſer degree of laxity in the ſkin. In the head, the teguments are firmer, and do not yield ſo readily to diſtention as in other parts of the body; by which any tumors lying beneath them muſt neceſſarily be more quickly brought to a period.

This circumſtance of ſituation has likewiſe a conſiderable effect on the firmneſs with which tumors are attached to the contiguous parts. In ſome ſituations they are ſo looſe and moveable, eſpecially while they continue ſmall, that they readily yield even to ſlight degrees of preſſure: but in others, particularly when they are covered with any fibres of muſcles, they are ſometimes very firmly fixed from their commencement. The attachment of tumors is alſo much influenced by their remaining free of inflammation, or their being to a greater or leſſer degree attacked with it; for they never become inflamed even in the ſlighteſt manner without ſome degree of adheſion being produced between the cyſts and correſponding teguments.

In the treatment of encyſted tumors, we are directed by authors to attempt the cure in the firſt place by reſolution; and if this fails, by extirpation. With a view to accompliſh a cure by reſolution, frictions with mercurial ointments are recommended, together with gum-plaſters and a variety of other applications. No practitioner, however, of the preſent age, will depend upon this management; nor will he expect to be able to remove theſe tumors in any other way than by the aſſiſtance of ſurgery.

We ſhall therefore ſuppoſe that the removal of one of them by an operation is agreed upon: The next point to be determined is the mode of effecting it; and this in a great meaſure ſhould depend upon the contents of the ſac. If they appear to be of the thin melicerous kind, which for the moſt part will be the caſe if a diſtinct fluctuation be diſcovered through the whole body of the tumor, it ought to be treated like a common abſceſs. In the ſmaller collections, the matter may be diſcharged by laying the teguments and cyſt open in the moſt de-

depending part of the tumor with a common lancet, and treating it in the ordinary way till it fills up or adheres from the bottom: But in large ſwellings of this kind, as a free admiſſion being given to the air proves always hurtful, the opening ought to be made in a manner the leaſt apt to be attended with this inconvenience. In a former publication, we have recommended the paſſing of a ſeton or cord through large abſceſſes as the beſt method of opening them; and as the ſame method may with equal propriety be employed in thoſe encyſted tumors which are formed by collections of thin matter, we ſhall refer to what was then ſaid upon the ſubject *. We ſhall juſt obſerve, that the cord ſhould paſs through the whole extent of the tumor, from the ſuperior part of it to the moſt depending point; and that the inferior opening at which it paſſes out ſhould be ſufficiently large for admitting the matter to be very freely diſcharged.

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* Vide Treatiſe on Ulcers, &c. Part I.

In this manner I have had many inſtances of large encyſted tumors being healed with much more eaſe than almoſt ever happens under the ordinary method of treatment. Several years ago, I gave my opinion upon this point at conſiderable length in the publication above alluded to; and farther experience of the advantages which reſult from it has tended much to confirm it.

This method of cure, however, is only applicable where the contents of tumors are ſo thin as to be eaſily diſcharged by a ſmall opening. When they are too firm to admit of this, they muſt either be emptied by an extenſive opening into the cyſt, or the cyſt with its contents muſt be diſſected out.

Where a cyſt containing matter adheres ſo firmly to the contiguous parts as to require much time to remove it by diſſection, it ſhould never be attempted. It will be ſufficient to lay it freely open through its whole extent by an inciſion, and to remove any looſe portion of it.

The contents of the tumor will in this manner be completely removed: and the cure may either be effected in the uſual way, by preſerving the wound open till it fills up with granulations from the bottom; or it may be attempted by drawing the divided edges of the ſkin together, and truſting to moderate preſſure and the ordinary effects of inflammation for producing a complete reunion. I have ſucceeded in both ways; and I think it neceſſary to obſerve, that both are equally certain, when a conſiderable part of a cyſt is left as when the whole is carefully diſſected off in the uſual manner. To thoſe who are accuſtomed to think that it is neceſſary to remove the cyſts of theſe tumors entirely, it will at firſt appear to be unſafe to allow any part of them to remain: Experience, however, will ſoon convince them that it may be done with ſafety. In common practice the removal of the cyſt is always adviſed; but where it is to be attempted, it is better to open the cyſt by a longitudinal cut through the whole tumor than to remove it entire. When the cyſt is empty, it is more readily laid hold of with the fingers or forceps, and more eaſily diſſected out, than when the bag remains full and diſtended.

When the bag is thus removed, the teguments ſhould be laid together and retained with adheſive plaſters, or with two or three ſutures, as the operator may incline: and if an equal preſſure be made over the whole, a cure may thus be obtained by the firſt intention. In every part of the body this is an object of importance, as it tends to ſhorten the cure; but it is particularly proper in the face and other external parts of the body, where the cicatrix produced by a tedious ſore proves frequently very unſeemly.

The arteries which ſupply the cyſts of theſe tumors are ſometimes ſo large as to pour out much blood when they are cut. In this caſe, they ſhould be immediately ſecured with ligatures: and if the threads be left of ſuch a length as to hang out at the lips of the wound, they prove no obſtacle to the cure being completed in the manner we have directed; for when they are applied with the tenaculum, as they ought to be, they may be drawn away with eaſe and ſafety at the end of the ſecond or third dreſſing. By an ill-timed caution, ſome practitioners, from an apprehenſion that ligatures in ſuch circumſtances may do harm, have adviſed that none of the arteries which appear in the removal of theſe tumors ſhould be tied. Nay, ſome have gone ſo far as to ſay, that it is ſeldom or never neceſſary to apply ligatures to ſuch arteries as are cut in the removal of ſcirrhous breaſts: But as I have known different inſtances of patients dying ſuddenly from loſs of blood where this precaution was neglected, and as I never met with a ſingle caſe of any harm being done by attending to it, I would adviſe every artery to be ſecured that does not ſtop immediately on being divided. Beſides the real danger which ſometimes occurs from this being neglected, the very intention of healing the ſore without the formation of matter is apt to be fruſtrated by it. In the removal of cancerous breaſts, where the edges of the divided ſkin have been drawn together ſo as to cover the ſore, by the burſting of an artery which had not been ſecured, ſuch a quantity of blood has been effuſed between the teguments and parts beneath, as has either prevented them from uniting, or has rendered it neceſſary to remove the bandages and to lay the parts again open in order to diſcover the bleeding veſſel. Of this I have met with different inſtances; and every practitioner of experience muſt probably have done the ſame.

In tumors of an ordinary ſize, there is never any neceſſity for removing any part of the ſkin. By a ſingle inciſion along the courſe of the tumor, in the manner we have directed, the ſac will either be ſufficiently opened, or it may be removed with equal eaſe as if it were opened, by a crucial inciſion; and although the ſkin may at firſt appear to be too extenſive, yet in the courſe of a ſhort ſpace of time it will contract ſo as merely to cover the parts beneath. But in very extenſive tumors, where the ſkin is ſo much diſtended as to give cauſe to imagine that it will be much puckered if part of it be not removed, it will be better to take away ſome portion of it. This will be beſt effected by two ſemilunar cuts including as much of the ſkin as ought to be taken away; and this being done, the portion of ſkin thus ſeparated muſt be removed along with the cyſt. And in the ſame manner, when we are operating upon a tumor where the prominent part of the ſkin is either ulcerated or rendered ſo thin by diſtention that we cannot with propriety attempt to ſave it, ſuch parts of it as are thus affected muſt be included between two ſemilunar cuts, and removed in the manner we have mentioned. In other reſpects, the cure muſt be conducted as if none of the ſkin were taken away, by drawing the divided edges of the teguments together, and endeavouring to make them unite by the firſt intention in the manner we have adviſed.

Where the tumor is ſo large as to render it proper to remove any part of the ſkin, we are deſired by ſome practitioners to do it with cauſtic; and by others cauſtic is uſed for opening every tumor. The only inſtance, however, in which cauſtic ſhould be employed, is where patients are ſo timid that they will not ſubmit to the uſe of the ſcalpel.

§ 2. *Of Ganglions.*

By the term Ganglion we here mean an indolent moveable tumor which forms upon the tendons in different parts of the body, but moſt frequently on the back part of the hand and joint of the wriſt.

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Tumors of this kind when preſſed upon are found to poſſeſs a conſiderable degree of elaſticity; by which they may in general be diſtinguiſhed from the encyſted tumors deſcribed in the laſt ſection. They ſeldom arrive at any great bulk; they are not often attended with pain; and for the moſt part the ſkin retains its natural appearance. On being laid open, they are found to contain a tough, viſcid, tranſparent, fluid, reſembling the white of an egg.

It ſeldom happens that tumors of this kind become ſo large as to render them objects of ſurgery: and when duly attended to on their firſt appearance, they may often be removed entirely, either by moderate friction frequently repeated, or gentle compreſſion applied to them by means of thin plates of lead or any other pliable metal. In this manner, they are more readily diſcuſſed than any other kind of ſwelling: but neither the friction nor the preſſure ſhould be carried too far, otherwiſe the ſkin may be ſo much fretted as to give riſe to inflammation; by which ſuppuration, and abſceſſes difficult of cure may be induced.

When this method of removing a ganglion does not ſucceed, nothing farther ſhould be attempted as long as the tumor remains of a ſmall ſize: But when it becomes ſo large as to prove troubleſome, either by impeding the motion of a joint, or in any other manner, it ought to be removed by exciſion, in the ſame manner as we have adviſed in the treatment of encyſted tumors when the cyſt is to be taken entirely away; that is, by making a longitudinal cut through the teguments over the whole extent of the tumor; and after ſeparating the ſkin from it on each ſide, to diſſect it off from the tendon: Or, when it is found to adhere ſo firmly to the contiguous parts as to render this impracticable, an inciſion may be made into it of ſuch a depth as to diſcharge the contents of it, when a cure may be effected by preſerving the wound open till it fills up with granulations from the bottom.

In general practitioners are averſe to operate in tumors of this kind, on the ſuppoſition of the wound being difficult to heal; but I have ſeldom known this to be the caſe.

§ 3. *Of Swellings of the Burſæ Mucoſæ.*

THE burſæ mucoſæ are ſmall membranous bags ſeated upon or very contiguous to the different large joints. They naturally contain a thin, tranſparent, gelatinous fluid, which ſeems to be intended for lubricating the parts upon which the tendons move that paſs over the joints. They are met with in other parts of the body, but chiefly about the hip-joint, that of the knee, ankle, ſhoulder, elbow, and wriſt *.

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* I am happy at having it in my power to announce

In a ſtate of health, the fluid contained in theſe burſæ or ſacs is in ſuch ſmall quantity that it cannot be diſcovered till they are laid open by diſſection: But in ſome caſes it accumulates to ſuch an extent as to produce tumors of a conſiderable ſize. This is not an unfrequent effect of contuſions and ſprains; and I have often met with it as a conſequence of rheumatiſm. The ſwelling is ſeldom attended with much pain: it yields to preſſure, but is more elaſtic than where ordinary matter is contained: at firſt it is always confined to one part of the joint; but in ſome caſes the quantity of accumulated fluid becomes ſo conſiderable as nearly to ſurround the joint. The ſkin always retains its natural appearance, unleſs it be attacked with inflammation.

The contents of theſe tumors are found to

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nounce to the public, that a deſcription of all the burſæ mucoſæ which have yet been diſcovered, with an account of the diſeaſes to which they are liable, will ſoon be publiſhed by Dr Monro.

to be of different kinds: and this variety ſeems to depend on the cauſe by which the ſwelling is produced; a circumſtance which merits particular attention. Thus when a ſwelling of this kind is induced by rheumatiſm, the contents of the tumor are commonly thin and altogether fluid, reſembling the ſynovia of the different joints; at leaſt this has been the caſe in any of thoſe which I have known opened: While in ſuch as proceed from ſprains, there is uſually found mixed with this tranſparent fluid, a conſiderable quantity of ſmall firm concretions. In a few caſes I have met with theſe concretions of a ſofter texture, ſo as to be eaſily compreſſed between the fingers; but in general they are too firm to admit of this. We may commonly, however, judge of this by the kind of fluctuation which is diſcovered in the tumor: when the concretions are ſoft, the fluctuation is uſually diſtinct; but when they are firm, it is not ſo clearly perceived, and they are eaſily felt beneath the fingers on being preſſed from one part of the ſac to another.

In practice it will be found to be an object of importance to be able to diſtinguiſh between thoſe collections which proceed from rheumatiſm, and ſuch as are the conſequences of old ſprains: For in the former, I believe, it will be ſeldom neceſſary to propoſe any operation; as in moſt inſtances, perhaps in all, the ſwelling will diſappear in courſe of time, merely by keeping the parts warm with flannel; by frequent frictions; by warm water being frequently pumped upon them; or by the application of bliſters. At leaſt this has happened in almoſt every rheumatic caſe of this kind in which I have been concerned. But in thoſe ſwellings of the burſæ mucoſæ, which originate from ſprains, although the quantity of effuſed fluid may remain ſtationary, it will ſeldom if ever diſappear entirely. In ſuch caſes, therefore, when the tumor arrives at ſuch a ſize as to prove troubleſome, we are under

der the neceſſity of propoſing an operation for removing it.

The only operation that is admiſſible, is the opening the ſac, ſo as to diſcharge the matter contained in it, and to preſerve the wound open till it fills up with granulations from the bottom. In moſt ſituations this may be done with ſafety; but in ſome parts, particularly about the joint of the wriſt, theſe collections are ſo covered with tendons that a good deal of caution and attention is required in the treatment of them. When it is found that the contiguity of tendons prevents the ſac from being opened to ſuch an extent as may probably enſure a cure, it will be better to lay it open at each end; and after preſſing out the contents, to paſs a ſmall ſeton or cord from one opening to the other. In this manner a ſlight degree of inflammation will be excited on the inſide of the ſac, when the cord may be withdrawn, ſo as to admit of a cure being attempted by gentle preſſure, applied with a roller over the courſe of the tumor. I have ſometimes ſucceeded in this way, when a cure could not be obtained by any other means; and when the cord is cautiouſly introduced with a blunt probe, no harm occurs from it, even when it paſſes beneath ſome of the tendons. The cord, however, ſhould not be continued ſo long as to induce any great degree of inflammation; for in the neighbourhood of large joints this might prove alarming: And we know from experience, that even a ſlight degree of inflammation anſwers the purpoſe ſufficiently.

A conſiderable degree of ſtiffneſs commonly remains upon that part of the joint where the tumor was ſituated. The moſt effectual remedy for this, is frequent frictions with emollients, and a proper application of warm ſteams to the part affected.

§ 4. *Of Collections within the Capſular Ligaments of Joints.*

COLLECTIONS of various kinds are met with in the capſular ligaments of joints. Blood may be effuſed within them. Inflammation is here, as in other parts, frequently ſucceeded by the formation of matter; and ſerous effuſions occur in them, forming what are commonly termed Dropſical Swellings of the joints.

Swellings of this kind ſhould be diſtinguiſhed with as much preciſion as poſſible. They are moſt apt to be confounded with collections in the burſæ mucoſæ, or with matter effuſed in the cellular ſubſtance covering the joints. From the firſt of theſe they may in general be diſtinguiſhed, by the contained fluid paſſing with freedom from one ſide of the joint to the other; and from its being diffuſed over the whole of it: Whereas, when it is contained in one of the burſæ, the tumor is more circumſcribed; being for the moſt part fixed above or upon one ſide of the joint. And in theſe there is ſeldom any great degree of pain; while collections of every kind within the capſular ligaments are apt to be painful.

They are more eaſily diſtinguiſhed from matter collected in the cellular ſubſtance covering the joints. In the laſt, the collection is evidently very ſuperficial; and it is not ſo much confined to the joint itſelf, being in general found to extend in every direction farther than the boundaries of the capſular ligaments.

We judge of the nature of the fluid collected in theſe ſwellings by the circumſtances which have preceded them, as well as by the ſymptoms with which they are accompanied. When a violent bruiſe of a joint is immediately ſucceeded by a large effuſion within the capſular ligament, it will probably be found to conſiſt chiefly of blood. This is not a frequent occurrence; but as I met with a remarkable inſtance of it in one caſe, I conclude that it may happen in others.

When inflammation of a joint terminates in effuſion within the capſular ligament, there will be reaſon to imagine that the matter forming the tumor is of a thin ſerous kind, with ſome tendency to purulency: for well-conditioned pus is ſeldom met with in ligamentous or membranous parts. And laſtly, when collections within the capſular ligaments ſucceed to rheumatic affections, there will be much reaſon to ſuppoſe that they are entirely ſerous; for we know that theſe effuſions which take place in rheumatiſm are very commonly of this kind.

The importance of our being able to diſtinguiſh the nature of the matter contained in theſe ſwellings, becomes obvious from the different practice which they require: As the making an opening into a large joint is always hazardous, from the pain and inflammation which it is apt to excite, it ſhould never be attempted but in caſes of neceſſity. One of the cauſes which in general are ſuppoſed to require it, is matter collected within the capſular ligaments: But when by experience we diſcover that a particular kind of matter may be allowed to remain in this ſituation without any detriment, we rather allow it to lodge, than to incur the riſk which often enſues from letting it out. Now this is uniformly the caſe with thoſe effuſions which we have mentioned as the conſequences of rheumatiſm. Whether they be collected in the burſæ mucoſæ, as mentioned in the laſt ſection, or within the capſular ligament of a joint, they ſhould never be laid open. Of whatever ſize they may be, they will very commonly be diſcuſſed by the remedies we have mentioned, namely, by frictions; the pouring of warm water upon the parts affected; by proper covering with flannel; and the uſe of bliſters: or, when theſe fail, ſupporting the tumefied parts with a laced ſtocking, or with a roller, applied with ſuch a degree of tightneſs as the patient can eaſily bear, will often prove ſucceſsful. But whether we are able to diſſipate the ſwelling entirely or not, when we are convinced that it is of the rheumatic kind, no opening ſhould be made into it. The patient may continue to complain of ſome uneaſineſs and ſtiffneſs in the joint, but this will always be trifling when compared with the pain and inflammation which may occur from laying it open. But when matter is collected in the cavities of joints, which may do miſchief by lodging, or which does not readily admit of abſorption, an opening ſhould be made for diſcharging it. The matter which forms in conſequence of high degrees of inflammation, and effuſed blood, are of this kind. Blood is indeed frequently extravaſated among ſoft parts without much detriment; but when in contact with cartilage or bone, it ſoon hurts them materially; and the ſame effect follows from the lodgement of matter formed by inflammation.

The danger which attends this operation, ſeems to depend in a great meaſure upon air finding admiſſion to the cavity of the joint; it ought, therefore, to be done in ſuch a manner as may moſt effectually prevent this occurrence. For this purpoſe the opening ſhould be made with a trocar; and if the ſkin be previouſly drawn tight to the upper part of the tumor, by pulling it down immediately on withdrawing the canula after all the fluid is evacuated, the riſk of air being admitted will thus be leſſened. A piece of adheſive plaſter ſhould be directly laid over the opening in the ſkin; and the whole joint ſhould be firmly ſupported, either with a laced ſtocking, or a flannel roller properly applied round it.

As a farther preventative of bad conſequences from this operation, if the patient be plethoric, he ſhould be blooded to ſuch an extent as his ſtrength will bear: He ſhould be put upon a ſtrict antiphlogiſtic regimen; and in every reſpect ſhould be managed with caution: for inflammation being very apt to enſue from it, we cannot be too much on our guard againſt it.

§ 5. *Of Concretions and preternatural Excreſcences within the capſular Ligaments of Joints.*

We ſometimes find joints become painful, and their motion much impeded, by the preternatural formation of different ſubſtances within the capſular ligaments. In ſome caſes they are ſmall looſe bodies, of a firmneſs equal to that of cartilage; and in others, they are of a ſoft membranous nature, ſprouting from an eroded ſurface of one of the bones forming the joint, or from the inner ſurface of the capſular ligament.

In ſome caſes, theſe ſubſtances remain always in nearly the ſame ſituation, without being much affected either by preſſure or by the motion of the joint; particularly in the ſoft membranous kinds of them, which are in ſome degree fixed by their attachments. But the others, which have nearly the firmneſs of cartilage, are commonly ſo moveable, that their ſituation is altered by the leaſt degree of motion; and they ſlip ſo eaſily on being touched, that it is difficult to fix them even with the fingers.

In the fomer, which remain fixed nearly to the ſame ſituation, the pain is conſtant, but it is ſeldom ſevere; where as in the latter, it is only felt in particular ſituations, perhaps when the connecting membrane paſſes between the ends of the bones: but in theſe caſes it proves often ſo excruciating as to be altogether unſupportable. I have known different inſtances of this, where in ſome particular poſtures of the leg, for it is in the knee in which theſe concretions ſeem chiefly to occur, the pain became ſuddenly ſo exquiſite as to induce fainting. And where this returns frequently, the patient is ſo much afraid of it, that he chooſes rather to avoid walking almoſt entirely than to run any riſk of inducing it. Nay, in ſome caſes, I have known the patient rouſed from the moſt profound ſleep, by the limb being merely moved when in bed.

As theſe ſubſtances are of a nature which will probably for ever reſiſt the powers of every medicine, and as they can only be removed by the joint being laid open, the queſtion to be determined is, Whether this ought to be attempted or not? Many ſpeak of this as an operation attended with ſo little riſk, that practitioners are apt to adviſe it in every caſe where the pain induced by the diſeaſe is in any degree ſevere. In two caſes, indeed, which fell within my own management, the joints of the knee were laid open; the foreign bodies were re-removed; and the wounds healed almoſt with the ſame eaſe, as might have been expected in ſimilar injuries in any other part of the body. But ſince that period, different inſtances have occurred where this operation induced the moſt alarming ſymptoms; which even terminated in ſuch a manner as to render it neceſſary to amputate the limb. I never obſerved indeed ſuch high degrees of inflammation from any other cauſe; neither is it confined to the joint itſelf. The whole limb, both above and below the wound, becomes ſtiff and ſwelled in a remarkable degree, with a painful inflammatory tenſion, extending from one end of it to the other.

The uncertain ſucceſs of this operation may make us doubtful in every inſtance of adviſing it. The following is the opinion I have formed on this point, drawn from a good deal of experience in caſes of this kind. Where concretions formed within the capſular ligaments of joints appear, upon examination with the fingers, to be perfectly looſe and detached, if the pain which they excite is very ſevere, rather than ſubmit to a long continuance of it, we ſhould venture in a cautious manner to take them out, by making an inciſion into the joint: But wherever there is much reaſon to ſuſpect that they are connected with any part of the joint, the patient ſhould rather be adviſed to ſubmit to the pain which they induce, which in general will be rendered moderate by avoiding exerciſe, than to run the riſk attending the extirpation of them.

The pain indeed, even in a retired life, may ſometimes become inſupportable. In this caſe I would adviſe the amputation of the limb. The remedy is no doubt ſevere; but it is leſs painful, as well as leſs hazardous, than the exciſion of any of thoſe concretions have ever proved that have been attached to the capſular ligaments.

The opening into the capſular ligament for the removal of theſe looſe bodies may be made in the following manner: If it is the joint of the knee or ankle that is to be opened, the patient ſhould be laid upon a table or on a bed;

but if any of the joints of the arm are to be opened, he may be allowed to ſit; only, in whatever poſture he may be, the limb ſhould be ſecured in the firmeſt manner by aſſiſtants, in that poſture which admits of the body to be taken out being felt in the moſt diſtinct manner. On this being done, the ſurgeon ſhould endeavour to fix it with the fingers of his left hand towards the upper part of the joint, after an aſſiſtant has been deſired to draw the ſkin as much as poſſible upwards from the part where the inciſion is intended to be made. The ſurgeon, with a ſcalpel in his right hand, is now to make an inciſion thro' the teguments and capſular ligament directly upon the ſubſtance itſelf, of ſuch a ſize as will admit of its being eaſily taken out; which may be done either with the point of one of the fingers, or with the end of a blunt probe paſſed in beneath it. If it is found to be connected by any ſmall filaments, either to the capſular ligament or to the cartilages of the joint, they ſhould be cautiouſly divided, either with a probe-pointed biſtoury or probe-pointed ſciſſars, after drawing the ſubſtance itſelf as far out as it can be got with ſmall-pointed forceps, or with a ſharp hook when it is of a texture that admits of a hook being uſed. When more concretions than one are found, they ſhould all be taken out at the ſame opening when this can be done: but when they lie on oppoſite ſides of the joint, two openings will be neceſſary; only in this caſe it will be better to allow the firſt inciſion to heal before attempting the ſecond, ſo as to avoid as much as poſſible the exciting of inflammation,

After the concretion is removed, the ſkin ſhould be immediately drawn over the wound in the capſular ligament; and the lips of the opening in the ſkin being laid together, they ſhould be ſecured in this ſituation by pieces of adheſive plaſter, ſo as to prevent the air from finding acceſs to the cavity of the joint.

Till the wound be completely healed, the patient ſhould not only be confined to bed, but the limb ſhould be kept as much as poſſible in one poſture; and a ſtrict antiphlogiſtic regimen ſhould be obſerved. But for the farther management of ſuch caſes, and of the ſymptoms with which they are apt to be attended, we muſt refer to Chap. XXXVI. Section VIII. on the ſubject of Wounds in the Ligaments.

We have deſired, that in making the inciſion into the capſular ligament, it may be done at the upper part of the joint. The intention of this is to prevent the ſynovia, after the ſkin is drawn over the opening in the ligament, from finding ſuch ready acceſs as it otherwiſe would do to lodge in the cellular membrane immediately beneath the ſkin; a precaution that is eaſily attended to, and from which ſome advantage may be derived.

§ 6. *Of Anaſarca or Oedema.*

THE terms Anaſarca and Oedema are applied to that variety of dropſical ſwelling where the water is collected, not in any diſtinct cavity, but in the cellular ſubſtance. The part is generally cold, and of a pale colour; and being poſſeſſed of little or no elaſticity, it retains the mark of the finger when preſſed upon.

In general, ſwellings of this kind are connected with ſome general affection of the ſyſtem; but in ſome caſes they occur in particular parts, from cauſes which affect theſe parts only. Thus, legs or arms which have been much weakened by contuſions or ſprains are apt to become œdematous. Tumors preſſing upon any of the larger lymphatics are apt to induce them. And they ſometimes occur from the lymphatics of a limb being cut, either by accident or by ſome chirurgical operation.

In the treatment of theſe ſwellings, this circumſtance of their being general or local requires particular attention. When they are induced by tumors preſſing upon the lymphatics, the removal of theſe tumors will alone effect a cure. And when weakneſs of a limb, in conſequence of ſprains or contuſions, ſeems to be the cauſe of them, the beſt method of cure will be to ſupport the weakened parts either with a laced ſtocking or a flannel roller, to prevent their yielding to diſtention, till in courſe of time, and by the effects of cold bathing and moderate frictions, they recover their natural tone.

But in thoſe anaſarcous ſwellings of the feet and legs which take place as a ſymptom of general dropſy, we muſt not venture upon removing or preventing them by compreſſion; for if the ſerum be prevented from falling down to the legs, it will be apt to fix upon parts of more importance. In theſe caſes, we truſt to the general tendency in the ſyſtem being removed by proper medicines, for obtaining a complete cure: But when the ſwelling becomes conſiderable, we have it in our power to procure a temporary relief, by diſcharging the water by ſmall punctures made through the ſkin into the cellular membrane, which will often empty the ſwelling of a whole limb. The relief which this procures is often ſo conſiderable, that we ought to adviſe it more early in the diſeaſe than is commonly done. It will ſeldom have any material effect on the cure of the diſeaſe; but beſides the preſent eaſe which it gives, it prevents that loſs of tone which the cellular ſubſtance muſt ſuffer, and which muſt always be detrimental where anaſarcous ſwellings are permitted to go to ſuch a height as they often do.

In general the water is diſcharged by inciſions inſtead of punctures: But ſmall punctures made with the point of a lancet anſwer the purpoſe better; they give a ſufficient vent to the water, at the ſame time that they are not ſo apt to inflame and mortify. But as we had occaſion to ſpeak of this when treating of the Anaſarcous Hydrocele in Chapter VI. Section II. we ſhall refer to what was then ſaid upon it.

Where the ſwelling is induced by any of the lymphatic veſſels of a limb being cut, as ſometimes happens in extirpating indurated glands from the arm-pit, ſmall punctures made in the under part of the limb afford immediate relief; while little advantage is derived from any other remedy.

§ 7. *Of the Spina Bifida.*

The term Spina Bifida is applied to thoſe ſmall ſoft ſwellings which ſometimes appear in the courſe of the ſpine in new-born children, moſt frequently at the inferior part of it, between the two laſt vertebræ of the loins. A fluctuation is diſtinctly perceived in them;

and the fluid which they contain can in ſome meaſure be preſſed in at an opening which takes place between the ſpinous proceſſes of the two vertebræ on which they are ſeated. In ſome caſes this opening is found on diſſection to proceed from a natural deficiency of bone; in others, from the ſpinous proceſſes of the vertebræ being merely ſeparated from each other: in all of them, the diſeaſe proceeds from ſerum collected within the natural coverings of the ſpinal marrow. In a few caſes it is connected with hydrocephalus; but this is not common. For the moſt part it is a local affection.

This is perhaps one of the moſt fatal diſeaſes to which infancy is liable; for as yet no remedy has been diſcovered for it. In ſome caſes, however, children labouring under it have lived for two or three years; but in general they linger and die in the ſpace of a few months. All the aſſiſtance that art has hitherto been able to afford, is to ſupport the tumor by gentle preſſure with a proper bandage. In this manner it has for ſome time been prevented from increaſing, by which life has been protracted; but this is all that we have yet been able to do.

It has ſometimes unfortunately happened, where the nature of theſe tumors has not been underſtood, that they have been laid open with a view to diſcharge the fluid contained in them. Experience ſhows, however, that every attempt of this kind ſhould be avoided; for hitherto the practice has uniformly proved unſucceſsful. The patient has either died ſuddenly, or in the courſe of a few hours after the operation.

If conjecture may at any time be indulged, and propoſals for innovation mentioned, it muſt ſurely be allowable in caſes hopeleſs as the one we are now conſidering. If the ſwelling in the ſpina bifida be produced by real diſeaſe ſubſiſting in the veſſels of the ſpinal marrow, or in thoſe of its membranes, it is not probable that any remedy will ever be diſcovered that will remove it: But if the opening between the ſpinous proceſſes of the vertebræ with which it is always accompanied, be not the *effect* of the diſeaſe, as it is commonly ſuppoſed to be, and if the want of ſupport which this deficiency of bone muſt create to the membranes of the ſpinal marrow be the *cauſe* of ſerous effuſions within theſe membranes, might not ſome advantage be derived from applying a ligature round the baſe of the tumor, not merely with a view to remove it, but alſo to draw the bottom of the cyſt ſo cloſely together that it may act as a proper ſupport to the parts beneath? Whether any benefit may be derived from it or not, is no doubt very uncertain: But in a diſeaſe which we know will otherwiſe terminate fatally, we are warranted in propoſing whatever can afford even the ſmalleſt chance of ſafety; ſo that I mean to attempt it in the firſt caſe of this kind that falls under my care. After applying a ligature as cloſely ly as poſſible to the baſe of the tumor, and as ſoon as the tumor itſelf has fallen off, I would propoſe to apply a firm-ſtuffed pad, ſimilar to that of a rupture-truſs, to the opening between the vertebræ; and by means of a proper bandage, to ſecure it with ſuch a degree of tightneſs as may ſerve to ſupport the parts within.

Whether or not this method may in any caſe effect a cure is uncertain; but it appears to be the moſt probable one of prolonging life: for wherever the tumor has been opened, death ſeems to have enſued more by the removal of ſupport from the contained parts than from any other cauſe. Now, no method of treatment we could adviſe would ſo readily compreſs the parts within, and at the ſame time remove the tumor.

The tumor termed Spina Bifida occurs, as we have already obſerved, in different parts of the ſpine; but a ſwelling of perhaps the ſame nature is ſometimes met with on different parts of the head. A tumor is obſerved at birth; and on examination, it is found to be formed by a fluid lodged beneath the membranes of the brain, which have been forced out at ſome unoſſified part of the ſkull. In ſome caſes the ſwelling remains ſtationary for a great length of time; but for the moſt part it becomes quickly larger, and at laſt terminates in death. Hitherto the ſame effect has reſulted from laying this kind of tumor open, as was mentioned to occur in caſes of ſpina bifida. The patient has commonly died in a few hours after the operation.

§ 8. *Of Scrophulous Tumors.*

In a former publication, when treating of the Scrophulous Ulcer, we offered ſome general obſervations upon ſcrophulous tumors. We ſhall now, therefore, refer to what was then ſaid, and at preſent advert to the method of treating them. It is not the cure of the ſcrophulous conſtitution which we mean to conſider: This ſubject belongs more to the province of medicine.

The firſt queſtion that occurs in the chirurgical treatment of a ſcrophulous tumor is, Whether we ſhould endeavour to promote the ſuppuration of it or not, by means of poultices and other external applications? For a conſiderable time I adopted this practice in the freeſt manner of applying warm poultices and fomentations to every tumor of this kind; but by experience I was at laſt convinced of its inefficacy. Nay, I now think that it often does harm: for ſcrophulous tumors being formed of matter which is not convertible into pus, poultices and other warm applications have little effect in bringing them forward; and when long uſed, they weaken and relax the parts ſo much, that the ſores which enſue are more difficult of cure than when poultices are not employed. In every ſcrophulous ſore, the parts are apt to remain long ſoft and ſpongy, by which they are prevented from healing. The effect of theſe emollient relaxing applications is to increaſe this tendency to ſoftneſs to a degree which often proves prejudicial.

As I know of no application which in the real ſcrophulous tumor ever proves uſeful, either in retarding its progreſs or in bringing it forward, I now adviſe even every covering to be laid aſide, unleſs the patient wiſhes to prevent the ſwelling from being ſeen; in which caſe he is deſired to cover it in the manner that is moſt agreeable to himſelf. But as I do not obſerve that expoſure to the air does harm, and as in ſome caſes I have thought that this expoſure of the tumor renders the ſubſequent ſores more eaſy to cure, I would prefer this mode of treatment whenever it can be done with propriety. Even the external application of hemlock, which in the form of poultices is often adviſed in ſcrophulous tumors as a diſcutient, ſhould be laid aſide. In ſcrophulous ſores, I have obſerved ſome advantage derived both from the internal exhibition and outward application of hemlock: but although I have often known it uſed in tumors of this kind, I cannot ſay that it was ever productive of any benefit. The only remedy I have ever known to act with any apparent efficacy in preventing ſcrophulous tumors from coming forward, has been a long continued uſe of the cold bath, particularly of ſea-bathing, and of mineral waters, eſpecially thoſe of Moffat: but in order to produce any effect, they ſhould be begun early in the diſeaſe, while the tumors are ſmall, and long perſiſted in. Indeed, as ſoon as it becomes ſufficiently obvious that a patient is attacked with ſcrophula, I would adviſe him, whenever it can be done, to reſort to ſuch a ſituation where one or other of theſe remedies can be employed with perhaps little interruption for ſeveral years together. In what manner the drinking of theſe mineral waters, or even of ſea-water, operates in preventing

ing the formation of tumors in ſcrophulous patients, will be difficult to determine: But it ſeems to be probable, that cold bathing proves chiefly uſeful by invigorating the ſyſtem at large, and particularly the lymphatic ſyſtem, which in ſcrophula appears to be remarkably weak and relaxed.

The next queſtion to be determined with reſpect to ſcrophulous tumors is, when they have become ſoft and even full of matter, whether they ſhould be opened, or allowed to burſt of themſelves? This ſhould in a great meaſure be determined by their ſituation. When they are ſeated upon any of the large joints, or upon the cavities of the thorax or abdomen, as there might be a riſk of the matter burſting into them, it ought certainly to be diſcharged by a free opening made with a lancet or ſcalpel; or in very large collections, where it might prove hurtful to expoſe the cavity of an extenſive abſceſs to the air, it may be done with more ſafety with a trocar, or by paſſing a ſeton or cord through it. But where the tumors are ſo ſituated that no harm can ariſe from the matter remaining in them, it is better that they ſhould be allowed to break of themſelves: for even when they are managed in the moſt judicious manner, the ſores which enſue will prove tedious and difficult to cure, while a ſcar will be the conſequence whether the tumor has been opened or not; and the patient and his friends, from ignorance of the nature of the diſeaſe, as well as from other motives, are apt to blame any opening that is made, as the cauſe either of a tedious cure or of an unſeemly mark. As an additional reaſon for this practice, I believe it will be found that ſores which enſue from ſcrophulous tumors will for the moſt part heal more kindly when allowed to burſt than when they are opened.

I have only to obſerve farther, that tumors of a ſcrupulous nature are ſometimes met with, which from inadvertency are apt to be miſtaken for thoſe of the real ſcirrhous kind. And there is cauſe to ſuſpect that miſtakes of this kind have tended to raiſe the reputation of different medicines, particularly of cicuta, as well as to have been the cauſe of the extirpation of tumors, which ought not to have been touched. When ſcrophulous tumors are deeply ſeated, they have commonly a degree of firmneſs which they do not poſſeſs in the more external parts; and when they are in a ſuſpicious ſituation, as in the glandular part of a woman's breaſt, they are apt to be miſtaken on a ſlight examination for ſwellings of a bad nature. But a moderate degree of attention will always prevent miſtakes of this kind: Even the firmeſt kind of the ſcrophulous tumor is ſoft and compreſſible when compared with the real ſcirrhus: It is always of a ſmooth equal ſurface; it is ſeldom in its early ſtages attended with pain; and for the moſt part ſimilar affections appear in other parts of the body; whereas the real ſcirrhus

rhus is always ſomewhat unequal or knotty: Although it does not for a conſiderable time become uniformly painful, a ſtinging diſagreeable pain is commonly felt in it from time to time, even from its firſt appearance; and it is not neceſſarily connected with ſymptoms of ſcrophula.

§ 9. *Of the Bronchocele.*

Every tumor of an indolent nature occupying the fore-part of the neck, is in common practice termed a Bronchocele. In the Engliſh language we have no preciſe denomination for it. In French this diſeaſe is termed Goitre.

Swellings in this ſituation would with more propriety be termed Tracheacelæ: But with a view to prevent confuſion, we think it better to retain that appellation under which they have commonly been deſcribed.

Authors mention different diſeaſes under

der this denomination: Some contending, that the term Bronchocele ſhould be confined to one variety of tumor; and others, that it may be applied to ſwellings of very different kinds. Diſputes of this nature, however, anſwer no good purpoſe; and as practical obſervations are the chief objects of this work, I think it better to mention the varieties of the diſeaſe, which I have either ſeen, or which have been accurately deſcribed by authors, with the treatment ſuited to each, than to enter the liſts of controverſy upon this ſubject.

1. The fore-part of the neck, like every part of the body ſupplied with large arteries, is liable to ſwellings of the aneuriſmal kind. They do not frequently occur in this ſituation, but inſtances of them are ſometimes met with.

This variety of the diſeaſe may be diſtinguiſhed by all the ordinary ſymptoms of aneuriſm: By its appearing ſuddenly after ſome violent exertion, particularly in coughing or laughing; by its being ſoft and compreſſible from the firſt; by the tumor being at firſt ſeated directly on the courſe of one of the carotid arteries; by the pulſe in the advanced ſtages of the diſeaſe being evidently affected by it, ſo as to become intermittent; and by a ſtrong pulſation being diſcovered thro' the whole extent of the tumor.

2. Encyſted tumors, particularly thoſe of the melicerous kind, are frequently met with on the courſe of the trachea. They are characteriſed by the ſame ſymptoms in this ſituation by which they are marked in other parts of the body: They are ſoft and compreſſible; the fluctuation of a fluid is evident upon preſſure; although they are always ſmall at firſt, they frequently become ſo extenſive, as to extend from one ear to another; and the ſkin uſually retains its natural appearance to the laſt. The ſeat of this variety of the diſeaſe is evidently in the cellular membrane.

3. Inſtances have occurred of tumors

forming in this ſituation, by the lining membrane of the trachea being forced out between two of the cartilages by violent fits of ſneezing, coughing, or laughing. In this caſe the ſwelling will at firſt be ſmall; and although ſoft and compreſſible, no fluctuation will be perceived in it.

4. The lymphatic glands of the neck have in ſome caſes of ſcrophula become ſo ſwelled, as to produce tumors of conſiderable magnitude over the whole courſe of the trachea. They are diſtinguiſhed by the ſymptoms which uſually accompany ſcrophulous ſwellings.

5. The thyroid gland has in ſome inſtances been known to ſwell to a great bulk, ſo as to induce tumors of an enormous ſize, extending from each ſide of the trachea to the angle of the correſponding jaw. In this variety of the diſeaſe, the ſwelling is at firſt ſoft; but no fluctuation is perceived in it: the ſkin retains its natural appearance; and no pain takes place in it: But as the tumor

advances in ſize,. it becomes unequally hard; being firm or elaſtic in ſome parts, and perfectly ſoft in others: The ſkin acquires a copper colour, and the veins of the neck become varicoſe; and in this ſtate of the diſeaſe the face becomes fluſhed, and the patient complains of frequent head-achs, as well as of ſtinging pains through the body of the tumor.

This is mentioned by authors as that variety of the diſeaſe which occurs ſo frequently among the inhabitants of the Alps and other mountainous countries, and which in general is ſuppoſed to originate from the uſe of ſnow-water.

6. Whatever may be the nature of thoſe varieties of bronchocele which occur in other kingdoms, I have reaſon to believe, that in this country it does not ſo frequently proceed from ſwellings of the thyroid gland as is commonly imagined. At leaſt in two caſes of bronchocele, the only ones where I had an opportunity of diſcovering the ſeat of the diſeaſe by diſſection, although it was

firmly believed in both of them that the ſwelling originated in the thyroid gland, yet on laying the parts open it was found to be much otherwiſe. This gland, inſtead of being increaſed, ſeemed evidently diminiſhed by the compreſſion produced by the tumor; and the ſwelling itſelf was chiefly formed of a condenſed cellular ſubſtance, with effuſions in different parts of it of a viſcid brown matter. In one caſe the tumor was chiefly fixed on one ſide of the neck; but in the other it occupied both ſides, and reached from one ear to the other, and from the ſternum to the chin. In both caſes the ſwelling ſubſiſted for a great number of years; and in one of them the patient died at laſt of another diſeaſe. At firſt they had no other appearance than might be expected from a natural increaſe in the parts lying contiguous to the trachea: they were ſoft and compreſſible; but no fluctuation was perceived in them, and the ſkin retained its natural colour: But as they increaſed in ſize, they likewiſe became firmer; for although at laſt a ſoftneſs, and even a fluctuation, was diſcovered in different parts of them, yet the principal part of the tumor continued hard, while others had a peculiar ſpringineſs or elaſticity, ſimilar to that of a tin caniſter: The veins on the ſurface of the tumors became turgid; and the face of a livid colour, evidently from the blood being impeded in its courſe from the head. In one caſe, the patient complained of much giddineſs: in both, the breathing was much obſtructed; and the patient, who died of the diſeaſe, ſeemed to ſuffer chiefly from this circumſtance.

Theſe are the varieties of bronchocele, for which one method of treatment cannot be applicable. And hence appears the abſurdity of ſpecifics for this diſeaſe, ſuch as calcined egg-ſhells, propoſed and recommended by authors: for although a medicine may be uſeful in one, yet it cannot prove ſo in all the varieties of it.

In the aneuriſmal bronchocele, the treatment ſuited to aneuriſm in general muſt be obſerved. To ſecure either of the carotid arteries with a ligature, will no doubt be conſidered as a hazardous operation: But here there is no alternative; whether it be a true or a falſe aneuriſm, death will enſue if it be not prevented by this operation. This chance, therefore, ought always to be given; as in other caſes of aneuriſm the artery ſhould be tied both above and below the affected part.

In caſes of bronchocele produced by encyſted tumors upon the trachea, what we have ſaid upon the treatment of theſe tumors in general will prove applicable. While they are ſmall, the cyſts with their contents may be removed in the manner we have mentioned: And even in the moſt enlarged ſtate of them, we need not deſpair of being able to afford effectual relief. When they are of the ſteatomatous kind, conſiſting of real fat, however large they may be, we may with propriety attempt to remove them: for in almoſt every inſtance, the connection of tumors of this deſcription with the contiguous parts is ſo ſlight, that they are removed with eaſe. The veſſels on the ſurface of the tumor may be enlarged; but theſe will be chiefly veins, and they may be eaſily avoided. In tumors conſiſting entirely of fat, I have never ſeen any of the arteries of ſuch a ſize as to be productive of any diſturbance; they are always ſmall, and are eaſily ſecured by compreſſion when they lie beyond the reach of ligatures.

When, again, the contents of the ſwelling are fluid, they may be diſcharged either by an inciſion with a ſcalpel, or by paſſing a ſeton or cord through the cyſt; and when the contained matter is of a pultaceous conſiſtence, forming what is termed an Atheroma, it muſt be diſcharged by a large opening in the moſt depending part of the tumor.

Where the tumor is formed by a hernia of the lining membrane of the trachea,

chea, gentle compreſſion is the only remedy to be depended on; and all ſuch exertions ſhould be avoided as might have any influence in producing it; particularly violent laughter, ſneezing, coughing, and crying. In ſcrophulous ſwellings of this kind, we muſt depend chiefly on thoſe remedies which prove moſt uſeful in other ſcrophulous affections: and with a view to remove the compreſſion produced upon the trachea, as well as upon the veins returning from the head, the contents of the tumors ſhould be diſcharged as ſoon as they are found to be in any degree fluid.

In that variety of the diſeaſe which originates from a tumefaction of the thyroid gland, frequent frictions prove uſeful, particularly when employed early, before the ſwelling has become large; and ſaponaceous and mercurial plaſters have in ſome caſes appeared to prove ſerviceable. Practitioners, however, are ſeldom conſulted in that ſtage of the diſeaſe in which remedies of this kind may be uſe-fully applied: For as the ſwelling does not often occaſion uneaſineſs at firſt, it is ſeldom mentioned by the patient till it has ſubſiſted for ſome time. In the enlarged ſtate of this gland, I do not ſuppoſe that any remedy will ever be found powerful enough to diſcuſs it: ſo that the only queſtions we have to determine are, Whether or not we ſhould attempt to remove the tumor by an operation? and whether it ſhould be done with cauſtic or the ſcalpel?

We know that this gland is very plentifully ſupplied with blood, and that the arteries which belong to it are uſually much enlarged in the diſeaſe we are now conſidering. This, together with the contiguity of the thyroid gland to the carotid arteries, which in this enlarged ſtate of that gland are even apt to be compreſſed by it, renders the extirpation of it in an advanced period of the diſeaſe extremely hazardous. For the arteries are of ſuch a magnitude as to pour out a great deal of blood in a ſhort ſpace of time; while they lie at ſuch a depth in this enlarged ſtate of the parts, that they cannot be eaſily laid hold of with ligatures, nor can much compreſſion be applied to them from their ſituation with reſpect to the trachea. I therefore conclude, that when tumors of this deſcription have acquired any conſiderable bulk, it would not be adviſable to run the hazard of attempting to remove them with the knife, and that the patient ſhould rather truſt to the treatment uſually employed in ſuch caſes for palliating the ſymptoms as they occur*. And although we are informed, that

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* Mr Gooch relates a caſe, where, in an attempt to remove a bronchocele by exciſion, ſuch profuſe hemorrhagy took place, that the operator, although very intrepid, was obliged to deſiſt before the operation was half finiſhed. No means that were employed could put a total ſtop to the blood; and the patient died in leſs than a week.

Another caſe had very nearly terminated fatally; and the patient's life was only preſerved by having a ſucceſſion of perſons to keep a conſtant preſſure upon the bleeding veſſels day and night for near a week, with their fingers on proper compreſſes, after the operator had been that in this ſituation the potential, and even the actual cauteries have been employed with advantage, yet the practice has not become ſo general as to make it probable that it has ever been ſucceſsful; nor can we, from what we have learned, preſume to recommend it in any ſtage of this diſorder.

But although the reaſons we have mentioned appear to be ſufficient for deterring us from attempting the removal of theſe tumors in any way when they are much enlarged; yet, while the gland is not much increaſed; when frictions and other remedies fail; and when the diſeaſe is continuing to advance; I think any practitioner would be warranted in adviſing it to be removed by exciſion: for in this early period of the diſeaſe, the difficulty of ſecuring the arteries with ligatures will be much leſs than it is found to be in the more advanced ſtages of it: at

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been repeatedly diſappointed in the uſe of the needle and ligature.—Vide Gooch's Medical and Chirurgical Obſervations, p. 136.

at leaſt the riſk occurring from this will be inconſiderable, when compared with that which will probably enſue from the tumor being allowed to remain.

In the ſixth and laſt variety of the diſeaſe which we have mentioned, frictions with mercurial ointment have in the firſt ſtages of it appeared to prove ſerviceable. And in one caſe the progreſs of the tumor was evidently retarded by repeated bliſters; but the patient going to a diſtance, they were neglected, and at laſt it arrived at a very enormous ſize. In this ſtate I ſaw him at the diſtance of ſeveral years, but I did not learn in what manner the caſe terminated. I have reaſon to think, however, from the appearance of the ſwelling, both at its commencement and in its more advanced ſtages, that it proceeded from an effuſion into the cellular ſubſtance of the neck, attended with that condenſed ſtate of this ſubſtance which was diſcovered by diſſection in the two caſes mentioned above.

But however ſerviceable bliſters, as well as other remedies, might prove in the early ſtages of the diſeaſe, no advantage can be expected from them when the tumor has acquired any great bulk. In this ſituation palliatives only ſhould be employed; for the baſis of the ſwelling uſually runs ſo deep, that it could not be removed but with the utmoſt hazard; and it is not probable that any advantage would be derived from laying it open; for, a conſiderable part of it being firm and ſolid, the ſize of the tumor would not be much diminiſhed by the diſcharge which might be procured, while the ſore that would enſue might degenerate into cancer.

§ 10. *Of Nævi Materni.*

By Nævi Materni are meant thoſe marks which we frequently find in different parts of the body at birth; and which are ſuppoſed to originate from impreſſions made on the mind of the mother during pregnancy. They are of various forms, being frequently found to reſemble ſtrawberries and cherries, and in other inſtances grapes, figs, pears, &c. Their colour is various; but for the moſt part they are of a deep red, reſembling the colour of claret or red port.

Many of theſe marks are perfectly flat, and never riſe above the level of the ſkin; and as they are not painful, they never in this ſtate become the objects of ſurgery. But in ſome caſes they appear from the firſt in the form of ſmall protuberances, which frequently increaſe ſo quickly as to arrive at great degrees of bulk in the courſe of a few months. I once ſaw a tumor of this kind in a child of a year old of the ſize of a gooſe's egg, which at birth was not larger than a pea.

No fluctuation is diſcovered in theſe tumors; on the contrary, they feel to be firm and fleſhy. In ſome caſes they are pendulous, and hang by ſlender attachments to the contiguous parts; but for the moſt part they are fixed by broad extenſive baſes.

Various remedies have been recommended for the removal of theſe excreſences; and in ancient times different charms were propoſed for them. The myſtery proceeding from this is perhaps one reaſon of the general averſion which ſtill prevails againſt any attempt being made to remove them. But ſo far as I have ſeen, no greater danger attends the removal of theſe ſwellings than the extirpation of any other tumor of the ſarcomatous kind. They are ſupplied indeed more plentifully than other tumors with blood: for in many inſtances they appear to be entirely formed by a congeries of ſmall blood-veſſels; but the arteries which go to them are in general eaſily ſecured with ligatures. It is proper, however, to remark, that the operation ſhould never be long delayed: for as the ſize of the veſſels depends upon that of the tumor, they ſometimes become ſo large as to throw out a good deal of blood before they can be ſecured; ſo that the operation ſhould always be propoſed as ſoon as it is obſerved that the tumor, inſtead of remaining ſtationary, acquires a greater bulk.

The operation is of a very ſimple nature. The tumor, with all the diſcoloured ſkin, is to be diſſected off with a ſcalpel; and the arteries being ſecured, the edges of the remaining ſkin ſhould be drawn together, and kept in this ſituation either with adheſive plaſters or ſutures: Or, when they cannot be drawn completely together, they may at leaſt be made to cover a conſiderable part of the ſore; by which the cure will be much ſhortened, and the cicatrix leſſened. In this caſe, that part of the ſore which is left uncovered muſt be treated like a wound from any other cauſe.

It is ſcarcely neceſſary to mention, that where the tumor is pendulous, and connected to the parts beneath by a narrow neck only, it ſhould be removed by tying a ligature round it of a degree of tightneſs ſufficient for putting an immediate ſtop to the circulation through the whole of it.

§ 11. *Of Warts.*

WARTS are indolent, ſmall, hard, colourleſs excreſcences, which appear on different parts of the body, but chiefly on the fingers and hands. They take their riſe from the cutis and cuticle. They occur at every period of life, but more frequently in infancy than in old age.

When from their ſize or ſituation warts do not prove troubleſome, they ſhould not be touched; for generally in courſe of time they either fall off or waſte gradually away. But ſometimes warts are ſo large and ſo ſituated that we are under the neceſſity of employing means for removing them.

When they are pendulous, and have

narrow necks, the eaſieſt method of taking them away is with ligatures: for this purpoſe a hair is ſometimes uſed, but a fine thread is preferable. But when their baſes are broad, we remove them either with the ſcalpel or with eſcharotic applications. There are few patients, however, who will ſubmit to the ſcalpel; and as we ſeldom fail with eſcharotics, they are generally employed.

The lunar cauſtic, or lapis infernalis, are the ſtrongeſt applications of this kind; but warts commonly become very painful after being two or three times rubbed with them. The ſame objection takes place to a ſolution of quickſilver in aquafortis, otherwiſe it proves a very powerful eſcharotic. Mercury diſſolved in an equal quantity, or even in double its weight, of ſtrong ſpirit of nitre, is a remedy that will not fail in removing warts of every kind; but as it is apt to ſpread, it ſhould be uſed with much caution. Pulvis ſabinæ being daily applied to warts, will for the moſt part remove them in the courſe of two or three weeks; but this likewiſe is apt to induce inflammation. The beſt application I have tried is crude ſal ammoniac: It acts ſlowly, but induces neither inflammation nor pain; and excepting in the very harder kinds of warts, it ſeldom fails in removing them. They ſhould be well rubbed two or three times daily with a piece of the ſalt previouſly moiſtened in water. Liquified ſalt of tartar ſometimes anſwers the purpoſe; and I have known ſpirit of hartſhorn prove ſucceſsful.

Warts frequently appear upon the penis as a ſymptom in venereal affections; and as they are nearly of the ſame nature with thoſe we have been conſidering, the ſame method of treatment will apply to them. In general, the tendency in the ſyſtem to produce them does not continue long; and if the parts be kept clean, they will at laſt begin to decay, and go entirely off whether any application be made to them or not. But as patients are always anxious to get free of them, practitioners are often induced to make trial of remedies which ſhould be avoided: For till this tendency to their formation is removed, they riſe almoſt as quickly as they are rubbed off. Nor has mercury any good effect here: I have known different mercurial courſes adviſed for the removal of warts; but they have never produced any advantage, and they very commonly do harm. When we have reaſon to ſuppoſe that every other ſymptom of the diſeaſe is eradicated, the continuance of warts ſhould be no inducement to the exhibition of more mercury. When they are tender on the ſurface, and produce matter, as is ſometimes the caſe, waſhing them morning and evening in lime-water, or in a weak ſolution of ſaccharum ſaturni, will commonly remove this; and at laſt they will diſappear in the manner we have mentioned. But when this delay will not be agreed to, one or other of the eſcharotics mentioned above muſt be employed; or if the patient conſents to their being removed with the ſcalpel, the parts from whence they are cut may be touched with lunar cauſtic, in order to prevent them, with as much certainty as poſſible, from returning.

It is proper to remark, that in the treatment of warts of every kind, we ſhould be cautious in avoiding every application which we have once obſerved to excite inflammation; for this ſymptom, when it arrives at any height, is difficult to remove. For the ſame reaſon, when a wart is to be removed with the ſcalpel, we ſhould rather encroach a little upon the ſound ſkin, than run any riſk of injuring the wart itſelf, or of leaving any part of it. By want of attention to this precaution, I have known the moſt formidable ſymptoms induced by what at firſt appeared to be ſuch a trifling excreſence, as not to deſerve notice. In one caſe, indeed, ſuch a painful obſtinate ſore enſued on the leg from the removal of a ſmall wart, that amputation of the limb was rendered neceſſary, in order to ſave the life of the patient.

§ 12. *Of Fleſhy Excreſences.*

No part of the body is altogether exempted from the formation of fleſhy tumors or excreſences. They differ from warts in being ſofter, and in their being apt to become large. They are ſeldom painful. In general they are ſomewhat more red than the ſkin in natural health; and for the moſt part they have a firmneſs of conſiſtence reſembling that of the lips. When laid open, they have at firſt ſight nearly the ſame appearance with a piece of muſcular ſubſtance newly divided: but on farther examination, no fibres can be diſcovered in them. They ſeem to conſiſt chiefly of cellular ſubſtance, with a great proportion of blood-veſſels infinitely ramified.

In the treatment of theſe tumors, no external applications are found to have any good effect. Eſcharotics have ſometimes been employed for removing them; but they ſeldom prove effectual, and they are very apt to irritate and excite inflammation. Whenever it is determined, therefore, to remove a tumor of this kind, it ſhould either be done with a ligature or with the ſcalpel. When the neck is narrow, the method by ligature ſhould be preferred; but when the attachment to the parts beneath is broad, this is inadmiſſible. When the ſcalpel is employed, care ſhould be taken that no part of the tumor be left; and the edges of the divided ſkin ſhould be drawn ſo together, as to cover as much of the remaining ſore as can with propriety be done. When any part of it does not heal by the firſt intention, it muſt be treated like a wound produced in any other manner.

§ 13. *Of Corns.*

CORNS are ſmall hard tubercles, which occur on different parts of the body, particularly on the toes and ſoles of the feet. In ſome caſes they appear to be of a horny inorganic nature: But in others, it is evident that they are ſupplied both with blood-veſſels and nerves, from their being painful, and diſcharging blood on being cut. For the moſt part they are ſeated in the ſkin: but in ſome inſtances they paſs to ſuch a depth as to reach the perioſteum; by which much pain and ſwelling are apt to occur on the contiguous parts. This is more eſpecially apt to happen when they are ſeated upon any of the joints, or upon parts thinly covered with fleſh.

The beſt preventative of corns, is the wearing of wide ſhoes, and avoiding every kind of preſſure: and unleſs this be attended to, it is impoſſible in any caſe to remove them. Various remedies are recommended for the cure or removal of corns. The moſt effectual I have ever tried, is the paring off all the inorganic part of them after bathing for the ſpace of half an hour or ſo in warm water, and immediately thereafter applying over them ſlips of ſoft leather ſpread with emplaſtrum gummoſum. If the ſoaking in water and paring the corns be repeated from time to time, and the application of this plaſter be continued, the corns will be kept eaſy, and the hard knots will often ſeparate and fall out; when, if preſſure be avoided, the vacancy produced by their removal will ſoon fill up with cellular ſubſtance, and no return of them will be experienced.

§ 14. *Of a ſimple Exoſtoſis, Venereal Nodes, and Spina Ventoſa.*

An Exoſtoſis is an indolent hard tumor originating from a bone. In ſome caſes it is altogether a local affection; being produced by a ſuperabundant callus in fractured bones; by bones being deeply wounded, or their ſubſtance eroded by an ulcer. In others, it appears as the ſymptom of ſome general affection of the ſyſtem, particularly of the lues venerea and ſcrophula. In the firſt of theſe diſeaſes, the tumor is termed a Venereal Node. When it appears as a ſymptom of ſcrophula, which it frequently does, it is uſually termed a Spina Ventoſa.

Exoſtoſes, when local, and proceeding from an effuſion of oſſeous matter in fractured or wounded bones, are ſeldom attended with pain; and after arriving at a certain ſize, they commonly remain ſtationary. But when they originate from an internal cauſe, they are commonly painful from the firſt; probably from the diſtention of the perioſteum, which being a firm membrane, and cloſely attached to the bone beneath, does not readily yield to the tumefaction. And in this caſe the ſwelling continues to advance, either till it burſts into a ſore, or till the diſeaſe in the conſtitution by which it was produced be eradicated.

In venereal nodes, the perioſteum is often found inflamed and much thickened; and in ſome caſes a ſmall quantity of a thin acrid ſerum is effuſed between this membrane and the bones. Hence, in thoſe caſes, the ſwelling in the bone appears to be much larger than it really is; for on being laid open, it is often found to be inconſiderable when compared with the previous ſize of the tumor. This has made ſome ſuſpect that the ſwelling which we term a Node in lues venerea, is not originally an affection of the bone, but a thickening of the perioſteum, and that the bone only ſuffers from its connection with this membrane. There is much reaſon, however, to imagine, that the reverſe of this is the caſe, and that the bone is the part primarily affected. For it is worthy of remark, that it is in the advanced ſtages of the ſyphilis only, that the bones are apt to be affected; and even then, that it is the hardeſt parts of them, ſuch as the fore-part of the tibia and the bones of the cranium, which are moſt apt to ſuffer.

In ſcrophulous patients we frequently find the whole ſubſtance of a bone ſwell, particularly the extremities of the large bones forming the joints of the knee, ankle, elbow, and wriſt. Various conjectures are met with in authors of the origin of the term Spina Ventoſa given to this ſwelling; but whatever may have been the firſt cauſe of it, or whether it be properly applied or not, we think it right to retain it, in order to prevent that confuſion which is apt to enſue from different names being given to the ſame diſeaſe.

In the ſpina ventoſa a pain is firſt diſcovered in the affected bone, and it is uſually ſo deeply ſeated, that the patient is led to think from his feelings, that it proceeds from the very centre of the bone. This ſometimes takes place for ſeveral days before any ſwelling is perceived; but for the moſt part a ſlight degree of fulneſs is obſerved from the firſt. When this occurs in a patient with other ſymptoms of ſcrophula, and eſpecially when it fixes on any of the large joints, there will be much cauſe to ſuſpect the nature of it. But it often happens that this is the firſt ſymptom of ſcrophula, eſpecially when it occurs in childhood: in which caſe both the parents and ſurgeon are apt to ſuſpect that it proceeds from a contuſion or ſprain; nor does the deluſion ceaſe with the former, till the diſeaſe becomes evident by breaking out in other parts of the body.

When theſe ſwellings occur in the middle part of bones, as ſometimes happens in the bones of the hands and feet, they are apt to advance quickly; and on the ſoft parts burſting above them, a thin ill-conditioned matter is diſcharged, and the bones are diſcovered to be carious on the introduction of a probe. But when the diſeaſe fixes on any of the large joints, although it ſeldom fails to terminate in a ſore at laſt, yet it commonly proceeds to this ſtate in a more gradual manner; nor does any remedy with which we are acquainted prevent the progreſs of it. In this ſituation it lays the foundation of what is uſually termed a White Swelling; a diſeaſe we have formerly conſidered at full length *.

When theſe ſwellings burſt and terminate in ſores, the ſoft ſpongy parts of the bones are found to be diſſolved; and on the matter which they produce being diſcharged, the remaining cavities have the appearance of being formed by all the interior parts of the bones having been ſcooped out, there being nothing left but a thin oſſeous covering formed of the hard external lamella of the bone. In this ſtate of the diſeaſe, the appearances which the bone exhibits are very ſimilar to thoſe of ſcrophulous ſores in the ſofter parts of the body: And as the ſpina ventoſa is in one ſtage of it, or another, almoſt

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* Vide Treatiſe on Ulcers, &c. Part III.

almoſt always accompanied with other ſymptoms of ſcrophula, I am clearly of opinion, as was elſewhere obſerved, that we ſhould conſider it entirely as a ſcrophulous affection, it being the ſame in the bones what ſcrophula in its more uſual form is in the lymphatic glands.

In the treatment of an exoſtoſis, the cauſe by which the tumor ſeems to have been induced requires particular attention. Where it is perfectly local, and formed merely by an exuberance of callus, although ſome deformity may enſue from it, yet it is ſeldom productive of ſo much pain or inconvenience as to induce the patient to ſpeak of it. But when tumors, even of this local kind, become ſo large as to prove troubleſome or painful, they neceſſarily excite the attention both of the patient and practitioner. As they are of a nature that will not yield to any medicine, we muſt truſt entirely, in thoſe caſes where it is neceſſary to remove them, to a chirurgical operation.

The patient being placed upon a table, and properly ſecured by aſſiſtants, if there be any riſk of contiguous large arteries being cut, a tourniquet ſhould in in the firſt place be applied ſo as to compreſs them above: An inciſion ſhould now be made through the teguments covering the tumor; and in order to give ſufficient freedom in the remaining ſteps of the operation, it ſhould not only be carried along the whole courſe of the ſwelling, but an inch or even more paſt each end of it, when it is ſo ſituated as to admit of it. The cut is now to be continued down to the bone, at the ſame time that the operator ſhould avoid as much as poſſible doing any injury to the contiguous muſcles, tendons, veins, arteries, and nerves. By a little attention to this part of the operation, much diſtreſs may be prevented; which might probably occur were it to be done in a more hurried manner.

On the bone being laid bare, we are next to determine on the beſt method of removing that part of it which forms the tumor: and this will depend upon the ſize of it. If it is merely a ſmall knob that can be admitted into the head of a trepan, it may be taken off with that inſtrument: or if it be too large for this, it may be removed with a common ſaw; and after taking away any ſpiculæ which might create irritation, the ſore may be treated like wounds produced in any other manner. The ſoft parts ſhould be drawn over the bone, and the edges of the ſkin being laid together and ſecured with adheſive plaſters, a cure may poſſibly be obtained by the firſt intention. In ſome caſes, indeed, this may be prevented by ſmall exfoliations taking place from the ſite of the tumor. I know, however, from experience, that it will ſometimes ſucceed, and therefore I would always adviſe it to be attempted; for even where ſmall exfoliations take place, the pieces of bone will be forced to the ſurface, and may be afterwards taken out long after the cure of the ſoft parts is completed.

An exoſtoſis, however, is ſometimes found to ſurround a bone entirely. In this caſe the treatment now adviſed will not apply. In this ſituation, that portion of the bone muſt be taken out on which the exoſtoſis is fixed, when the bone is of ſuch a length and is ſo ſituated as to admit of it: But as this can ſcarcely be done in the ſmall bones of the hands and feet, when any of theſe are affected it becomes neceſſary to remove the diſeaſed bone entirely. In a caſe of this kind which occurred on one of the metatarſal bones, and where the exoſtoſis ſurrounded the whole circumference of the bone, I thought it better to take out the bone altogether, than to leave the two ends of it only. The one operation was performed with no great difficulty: the other would have been much more painful as well as more tedious, and it would not have proved more ſucceſsful. For although the part did not fill up with bone, it became ſufficiently firm to enable the patient to walk as well as he did before.

In the long bones, however, of the thighs, legs, or arms, we may ſafely venture to remove any portion of them on which an exoſtoſis is fixed: and where the conſtitution is healthy, we need never deſpair of nature ſupplying the deficiency; for inſtances have been often met with, even of entire bones being regenerated. When a portion of bone is to be removed, after laying it freely bare by an extenſive inciſion, a piece of paſteboard, or a thin ſheet of lead, ſhould be paſſed beneath it, in order to protect the parts below from the teeth of the ſaw. Where a portion of the fibula or tibia is to be removed, the ſplint muſt be paſſed in between theſe bones; and when either of the bones of the fore-arm are affected, it muſt be paſſed between the radius and ulna. Different forms of ſaws have been employed for dividing the bone; but the common ſaw uſed in amputations anſwers better perhaps than any other.

When the portion of bone is removed, the ſore ſhould be dreſſed with the mildeſt applications; a piece of ſoft lint ſpread with the common wax liniment, or merely dipped in oil, ſhould be inſerted between the lips of the wound; and if any thing be employed for retaining them, it ſhould be the many-tailed bandage, which can be undone without moving the limb. It is a matter of importance to place the limb in a ſituation the moſt favourable for the diſcharge of matter; and as the operator has it commonly in his power to make the wound more or leſs inclined to any ſide of a limb, this circumſtance ſhould be attended to in the firſt part of the operation.

When the operation has been performed upon either of the bones of the leg or fore-arm, the remaining ſound bone will always keep the limb at its full length, ſo that there will be little or no riſk of its becoming ſhorter. But when a portion of a ſingle bone is taken out, ſome attention is required to prevent the limb from becoming ſhorter during the cure. For this purpoſe different machines have been invented; but I have never found any aſſiſtance of this kind neceſſary: for if the patient be informed of the great importance of keeping the limb in a proper poſture, he will give it all the attention that is requiſite: and beſides, much inconvenience, pain, and inflammation, are apt to enſue from any inſtrument employed for this purpoſe, when applied with that tightneſs that is neceſſary for keeping a limb in a ſtate of extenſion.

During the cure of the ſore, the chief object is to prevent matter from lodging and paſſing between the contiguous ſound parts. If this be prevented, and the lips of the wound kept open by the eaſy dreſſings we have mentioned, till it fills up with granulations from the bottom, the reſt will be accompliſhed by nature alone. Thoſe ſoft granulations which at firſt occupied all the vacancy between the ends of the divided bones will ſoon acquire the conſiſtence and ſtrength of bone; and in the courſe of a ſhort time, if the general ſtate of health continues good, the limb will become equally uſeful as it was before.

Hitherto we have ſuppoſed the diſeaſe to be ſeated in the extremities. But tumors of this kind are alſo found in other parts of the body: on different parts of the ſkull; on the under-jaw; on the ribs and clavicles; and I once ſaw a large exoſtoſis on the upper part of the ſcapula. But wherever they are ſituated, the treatment is the ſame. While they give no uneaſineſs, nothing ſhould be done; for they will ſometimes continue ſmall and ſtationary for life: But when they increaſe and prove troubleſome, the ſooner they are removed the better; for the earlier the operation is performed, the more eaſily will it be done.

In that variety of exoſtoſis termed a Node, proceeding from the lues venerea, the firſt point to be determined is the ſtate of the ſyſtem. The patient ſhould be immediately put upon ſuch a courſe of mercury as can be depended upon for the removal of any infection he may labour under; and if the tumor in the bone be recent, and not far advanced, it may be carried off by the mercury alone. With a view, however, to make the medicine as effectual as poſſible, it ſhould be thrown in as quickly, and in as great quantities, as the patient can bear: for the ſyſtem being completely infected with the virus before nodes appear, it requires, for the moſt part, a very conſiſiderable quantity of the medicine to check their progreſs.

At the ſame time that mercury is given inwardly, it is a common practice to rub the part itſelf with mercurial ointment, or to keep it covered with mercurial plaſter. I have never obſerved, however, that any advantage is derived from this; and I think it is apt to do harm. In tumors of this kind there is much reaſon to ſuppoſe that the perioſteum becomes inflamed from the firſt.

In different inſtances, the inflammation has appeared to be aggravated both by the application of plaſters, and by the friction uſed with mercurial ointment. Till we know whether the internal exhibition of mercury is to prove effectual or not, ſome mild ſedative application, ſuch as a ſolution of ſaccharum ſaturni, or the unguentum nutritum, which is a preparation of lead, ſhould only be employed. Theſe keep the parts eaſy; and by tending to remove inflammation, they may even have ſome influence in removing the tumor.

But if we find, after there is full evidence of the mercury having entered the ſyſtem, that the local affection of the bone ſtill continues to advance, that the tumor becomes larger and the pain more ſevere, other remedies ſhould be adviſed. In this ſituation, I have ſometimes found the pain relieved immediately by the application of ſeveral leeches over the tumor; and the pain being rendered moderate, we are thereby enabled to delay every other remedy till a more complete trial be given to the mercury. In ſome caſes, where leeches have failed, bliſters applied directly upon the parts affected have proved ſucceſsful. Neither they nor leeches can have any influence on the original diſeaſe: they will not leſſen the tumor of the bone; but by leſſening the tenſion of the perioſteum, they will prove more uſeful than perhaps any other remedy we could employ.

Sometimes, however, when theſe means are too long delayed; when the tumor advances with more rapidity than uſual; or when acrid matter is perhaps confined beneath the perioſteum; neither leeches nor bliſters afford relief. In ſuch caſes, an inciſion made along the courſe of the tumor to the depth of the bone, will often give immediate eaſe. The matter evacuated from theſe tumors is frequently a thin brown ſanies; at other times, it is a viſcid tranſparent mucus.

In ſome caſes the inciſion heals kindly by common treatment, even when the tumor of the bone is by no means inconſiderable. Healthy granulations will form, and a cure of the ſore will be accompliſhed, even before the patient has taken as much mercury as may be judged neceſſary for the cure of the diſeaſe. In ſuch caſes, the tumefaction of the bone is not to be regarded: It may probably, indeed, continue during the life of the patient; but no inconveniency will afterwards enſue from it. So that unleſs it be ſo ſituated as to produce much deformity, it ſhould never be touched.

But, on other occaſions, the ſore, inſtead of healing eaſily, will remain obſtinate, notwithſtanding all the remedies that can be employed. In ſuch circumſtances, the obſtinacy in the ſore is for the moſt part ſuppoſed to ariſe from the venereal virus not being deſtroyed, and a farther continuance of mercury is therefore adviſed. The mercurial courſe ſhould no doubt be carried ſo far as there is any chance of its proving uſeful. But beyond this, it will commonly prove hurtful, and will rather tend to protract the cure of every ſore. This, however, is a point upon which no preciſe directions can be given; the judgment of the practitioner in attendance muſt determine it.

When the obſtinacy of the ſores depends upon other diſeaſes of the ſyſtem, the removal of theſe will forward the cure. But when there ſeems to be a tendency in the diſeaſed bone to exfoliate, the completion of this proceſs will alone prove effectual. In ſuch circumſtances, the treatment adapted to promote exfoliation ought to be purſued: But as we have elſewhere conſidered this ſubject fully, it is unneceſſary now to enter upon it *.

After all the diſeaſed parts of the bone are removed, the ſore will for the moſt part heal readily. But in ſome caſes, ſuch a fullneſs and thickening of the perioſteum and other contiguous parts has been produced by the long continuance

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* *Vide* Treatiſe on Ulcers, &c. Part II. Sect. VII.

ance of the diſeaſe, that the cure ſtill proceeds ſlowly. In ſuch circumſtances, mild emollient applications do harm: and nothing in general proves ſo uſeful as thoſe ointments that are ſtrongly impregnated with red precipitate, or with verdigris. In ſome caſes, even theſe do not act very ſpeedily; when touching the ſurface of the ſore once in two or three days with lunar cauſtic or with lapis infernalis, will make the ſloughs throw off, and for the moſt part their place will be ſupplied by healthy granulations; after which, the cure will probably proceed without interruption.

In deſcribing this variety of exoſtoſis, we have repeatedly mentioned the pain which attends it; a ſymptom which always takes place; at leaſt I never met with an inſtance of the contrary. Venereal nodes, particularly thoſe on the head, are not indeed always accompanied with much pain, but merely with a ſlight uneaſineſs. But this variety of node does not originate from the bone, but proceeds merely from an affection of the perioſteum. In this caſe the tumor commonly ſubſides entirely, either by the effects of mercury alone, or by the application of a bliſter; and no advantage is derived from making an inciſion into it. But in the other, if the bone be affected in any conſiderable degree, the tumor never ſubſides, if it be not by a portion of the bone exfoliating. Even after every other ſymptom of the diſeaſe is removed, theſe tumors in the bones continue equally fixed and large as they were at firſt. We judge that a node proceeds from the bone itſelf; by the pain, as we have juſt obſerved, being in general acute; by the tumor being conſiderably harder than when the perioſteum only is affected; by its advancing much more ſlowly than the other; and by its continuing fixed and permanent, notwithſtanding all the remedies we can employ to remove it.

We come now to ſpeak of the treatment of the ſpina ventoſa, or that variety of exoſtoſis which we ſuppoſe to originate from ſcrophula; and I am ſorry to obſerve, that I have nothing ſatisfactory to offer upon it. Fomentations, ointments, plaſters, and a variety of other remedies, are recommended; but I know of none that any advantage has ever been derived from. Tumors of this kind which appear formidable at firſt, will ſometimes indeed continue ſtationary, either from the ſcrophulous diſpoſition in the ſyſtem being checked by cold-bathing, or ſome other ſimilar remedy; or from ſome change taking place in the conſtitution, with the nature of which we are perhaps altogether unacquainted. But this is a rare occurrence: for in general, notwithſtanding all the remedies we employ, a ſpina ventoſa, from its firſt appearance, proceeds in a gradual manner to turn worſe.

When the diſeaſe appears at the ſame time in different parts of the body, all we can with propriety attempt, is to ſupport the conſtitution with a proper diet. To adviſe bark and cold-bathing as the beſt ſtrengthening remedies; and when the pain is ſevere, to endeavour to render it moderate by adequate doſes of opium. But when it is confined to one part, as often happens in the knee and other large joints, in caſes of white ſwelling, it becomes frequently adviſable to remove the diſeaſed part by an operation. In affections of the joints, it has been the common practice in this ſituation to amputate the diſeaſed limbs entirely. But an attempt has lately been made by Mr Park, an ingenious ſurgeon in Liverpool, to ſave the limbs that are thus diſeaſed, by removing the heads of the affected bones only, and afterwards healing the ſore at which they were taken out. When we come to treat of the operation of amputation, we ſhall enter more fully into the conſideration of this; for we think it highly deſerving of notice: and at preſent ſhall only remark, that there is cauſe to ſuſpect that it will not be found to prove ſo generally uſeful, as at firſt view might be expected. But in local ſwellings of this kind which occur on the middle of bones, we think it right to obſerve, that the ſame practice may be purſued which we have already recommended for the removal of thoſe caſes of exoſtoſes which proceed from external violence: The ſwelled portion of bone may be cut out when it is ſituated on any of the long bones of the extremities; and on any of the ſhort bones of the hands or feet, the diſeaſed bones may be removed entirely.

EXPLANATION OF THE PLATES.

PLATE LXVII.

[Oppoſite to page 59.]

Figures 1. 2. 3. and 4. are different repreſentations of the edges of wounds drawn together, and retained by adheſive plaſters, as mentioned in page 58.

PLATE LXVIII.

[Oppoſite to page 145.]

The different figures in this plate repreſent an apparatus for the cure of a rupture of the tendo Achillis. An explanation of it is given in p. 145, &c.

PLATE

PLATE LXIX.

[Oppoſite to page 178.]

The figure in this plate is the invention of Mr Chabert of Paris, and is taken from the ſecond volume of Memoirs of the Royal Academy of Surgery: It is the beſt inſtrument that has yet been publiſhed for compreſſing the jugular veins.

It conſiſts of two curved pieces of ſteel, *A A*, connected by a joint at the back-part of the machine, *D*. One of the ſides terminates in a horizontal plate, B; the teeth of which paſſing through a hole in the oppoſite plate, the preſſure made with it may be increaſed or diminiſhed at pleaſure. The cuſhion, *C*, is meant to be placed upon the jugular vein, either upon a bleeding orifice in caſes of hemorrhagy, or immediately below the opening to be made into it where blood is to be taken from this vein. This cuſhion ſhould be moveable, ſo as to paſs with eaſe from one part of the inſtrument to another. Every part of the machine, excepting the plate *B*, ſhould be covered with ſoft leather.

ERRATA.

Page 145. line 10. for LXVII. read LXVIII.
168. line 22. for *wing* read *owing*.
312. line 2. for *attd* read *attended*.

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